

T H E
B E A U T I E S
O F
N A T U R E and A R T
D I S P L A Y E D,
I N A
T O U R through the W O R L D;
C O N T A I N I N G,

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| <p>I. A General Account of all the Countries in the World, remarkable for either Natural or Artificial Curiosities; their Situation, Boundaries, Extent and Divisions; their Rivers, Air, Soils, Chief Cities, &c.</p> <p>II. A particular Account of the most curious natural Productions of each Country, in the Animal, Vegetable, and Fossil Kingdoms; of remarkable Mountains, Caverns, and Volcano's; of Medicinal and other singular Springs; of Cataracts, Whirlpools, &c.</p> <p>III. An Historical Account of the most remarkable Earthquakes, Inundations, Fires, Epidemic Diseases, and other public Calami-</p> | <p>ties, which have, at different times, visited the Inhabitants.</p> <p>IV. Extraordinary Instances of Longevity, Fertility, &c. among the Inhabitants; together with an Account of their most celebrated Inventions, Discoveries, &c.</p> <p>V. Particular Descriptions of the most remarkable Public Buildings, and other singular Productions of Art.</p> <p>VI. Curious Remains of Antiquity; remarkable Laws, Customs, and Traditions of the Inhabitants; together with a Summary View of the most extraordinary Revolutions among them.</p> |
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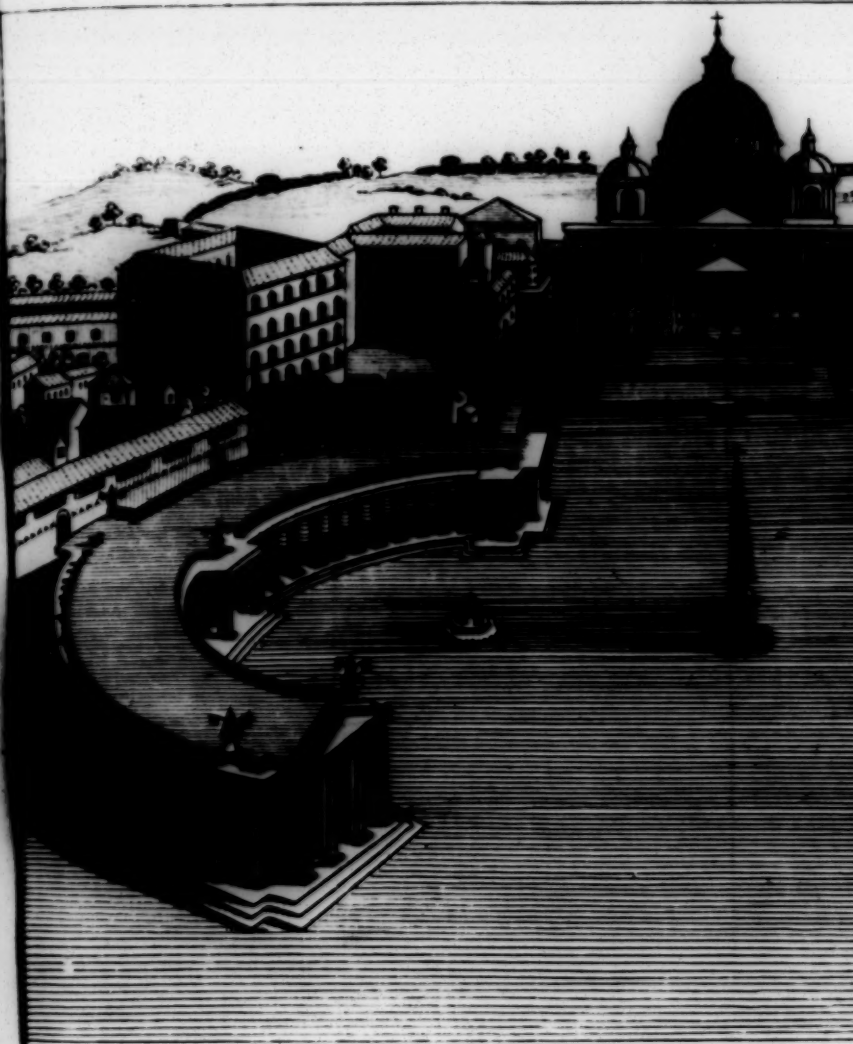
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V O L. VII.

L O N D O N :

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The West End of St. Peter



St. Peter's at Rome .





THE
BEAUTIES
OF
NATURE AND ART
DISPLAYED;
IN A
TOUR through the WORLD.

CHAP. IV. *Continued.*

SECT. V.

*Particular Descriptions of the most remarkable
Public Buildings, and other singular Productions
of Art in Italy.*

CHURCHES.

THE cathedral church of St. Peter
at Rome, after which model St.
Paul's cathedral in London was
built, is universally allowed to be
the noblest and most magnificent church in the
world. The harmony and proportion of the
architecture are so judiciously observed, that
nothing appears distinguished above the rest;

the great beauty and variety of carved and gilt work, the exquisite paintings, embossed works and statues of marble, brass and other materials, are so highly finished, and so happily disposed, that the whole fills the mind of the spectator with admiration and pleasing astonishment.

This church, which stands on the site of Caligula's circus, was founded by Constantine the Great, in the year 324, and dedicated to the twelve apostles : he spared no expence of raising it to the highest pitch of beauty and splendor, and many Christian princes contributed largely towards the maintenance and repairs of it, but none more than King Pepin of France and Charlemagne, who bestowed whole provinces on it ; notwithstanding which, the Popes found themselves under a necessity to rebuild it from the very foundations. Pope Julius the Second began the present structure, in 1550, according to a plan of the celebrated architect Bramante Lazari. The next Pope Paul the Third continued the building, under the direction of Michael Angelo, who greatly improved the former plan ; and the church was finished under the pontificate of Julius the Fifth, about an hundred years after it was begun.

The length of this famous cathedral, measured on the outside, including the portico, is seven hundred and twenty-two feet, and on the inside, five hundred and ninety-four feet : the
length

length of the cross, from north to south, is four hundred and ninety feet on the outside, and on the inside, four hundred and thirty-eight feet; the breadth of the body of the church is eighty-six feet, and the height one hundred and forty-four feet; the circumference of the cupola, on the inside, is six hundred and twenty feet, and the diameter of it within one hundred and forty-three feet. The breadth of the front of the church is four hundred feet, and from the pavement to the top of the cross that stands over the ball, four hundred and thirty-two feet; the diameter of the ball is eight feet four inches, and the height of the cross above the ball is twenty-five feet.

A circular area, which lies before this magnificent edifice, is encompassed by a beautiful peristyle, or colonade, consisting of two hundred and eighty-four marble pillars of the Doric order, which support an architrave, adorned with a vast number of statues of saints and martyrs, done by the best hands, and in the grandest style. In the middle of the area stands an obelisk of Egyptian marble seventy-two feet high, and a fine fountain on each side of it is a great addition to the beauty of this spacious court, from whence there is a flight of steps to a grand platform or terrace, that leads into the lofty portico before the church. Over this portico, which is supported by pillars three fathoms in circumference, are the statues of our Saviour and the twelve apostles; and there is a fine balcony, wherein the Popes

are crowned in view of all the people. The body of the church, as well as the cupola, which is adorned with curious Mosaic work, is sustained by large square pillars like those of St. Paul's, and under the middle of the cupola stands the high altar, which has a magnificence hardly to be paralleled. It is ninety feet in height, being a kind of pavilion supported by four wreathed columns of brass, adorned with foliage, and on the top of the canopy are four angels of gilt brass, holding festoons of flowers most beautifully carved; and between them are figures of children playing on the cornice. We ascend to the dome by a winding stair-case without steps, and from thence to the ball by stairs not very commodious, which lie between the outer and inner dome. St. Peter's chair is all of brass gilt, and supported by four gigantic figures, representing four fathers of the church, with a gilded glory over them reaching quite to the roof. Under this chair there is an altar, and on each side are stately monuments of brass and marble, of excellent workmanship. It is scarce possible to describe the riches and beauty of the little chapels and altars round this church. But among all the ornaments of this cathedral, perhaps none deserve our attention more than the Mosaic pictures*, which represent a great many
pieces

* Mosaic work, is an assemblage of little pieces of glass, marble, precious stones, wood, or the like, of various colours, cut square and cemented
on

pieces of scripture and ecclesiastical history, and exceed any thing of that kind that ever was done by the antients.

Next to St. Peter's, the cathedral church of Milan is by some reckoned the most magnificent structure in Italy. It is a vast Gothic edifice, about five hundred feet in length, and two hundred in breadth, and is all of marble. A hundred and sixty pillars of white marble support its stately roof, each of them valued at ten thousand crowns. The choir is wainscotted, and adorned with beautiful carved work representing the histories of the gospel. The high altar is very sumptuous and majestic;

on a ground of plaister, &c. imitating the natural colours and degradations of painting. In this sense it includes marquetry or inlaid work, vaneering, &c. but in its more proper and restrained sense it only takes in works of stone, metals, and glass, those of wood being distinguished by the name of marquetry. The Mosaic of marble, which at present is most in use, serves for the pavement of churches and palaces, and the incrustation of the walls of the same edifices; but that of precious stones is so expensive, that it is seldom used unless in small works, such as ornaments for altar-pieces, rich tables, &c. The Mosaic work so much admired in St. Peter's at Rome is done with coloured glass, which kind, though now little used, is of a surprising durability and lustre. It is laid on a sort of plaister composed of lime, fine brick-dust, gum-tragacanth

jestic ; and here are two noble brazen pulpits, each of them running round a large pillar like a balcony, and supported by huge figures of the same metal. As to the statues about this church, their number is prodigious, many of them as big as the life, and some of exquisite workmanship ; but those who make them amount to eleven thousand must include in the computation every particular figure in the history-pieces, and all those small ones that are frequently placed about the larger statues.

Underneath this church is a chapel, where the body of St. Charles de Boromeo is preserved intire, and where that Saint has a shrine of crystal, embellished with gold, silver, and

canth, the whites of eggs, and other ingredients ; the pieces of glass being ranged with so much justness, and the light and shadow so well observed, that they appear as smooth as a table of marble, and as finished as a painting in Fresco ; with this advantage, that they have a fine lustre, and will last almost for ever, whereas time effaces all other kinds of painting.

There is another sort of Mosaic work, of a more modern invention than any of the former, made with a kind of Gypsum, or Talc, found in the stone quarries near Paris. Of this Talc, calcined in a kiln, beaten in a mortar, and sifted, they form a sort of artificial marbles, imitating precious stones, and of these compose a Mosaic work, little inferior to the natural stones, either in point of durableness or vivacity.

precious

precious stones ; the walls of this chapel are lined with plates of silver.

The cathedral of Florence is one of the most superb and beautiful structures in Europe, the walls and pavement being of marble of various colours. It is four hundred and eighty feet long, and three hundred and eighty feet high to the top of the cross. The cupola is lofty and of a vast circumference, being the first of the kind that ever was built in Europe, from whence St. Peter's at Rome was copied. The painting on the inside of it represents the resurrection and the last judgment, and the body of the church is likewise adorned with the finest paintings, sculptures, and a vast number of stately monuments. The bell-tower or steeple, detached from the church, is much admired, being a hundred and eighty feet high, all of fine marble of several colours, and adorned with a great variety of curious carvings and figures. The Baptistery which stands before the church, was antiently a temple of Mars, and is now remarkable for its three brazen gates, on which several pieces of scripture-history are so exquisitely represented in bass-relief, that Michael Angelo used to say, they were good enough to be the gates of Paradise.*

In

* These gates were the work of Laurentio Cion, and took him up fifty years in finishing. Bishop Burnet says, they are the best of the kind in the world, and adds, that the histories are represented

In this Cathedral is a meridian, traced by Paul Toscanelli, upwards of three centuries past, which, though it is in general but very little known, is yet the greatest of all the monuments in this kind. The vast solidity of the brass plate of this ancient meridian, destined to serve as a center to the dial-pin, which is seven lines thick, enclosed and sealed in the cornice of the lantern, which crowns the dome, and supported by two strong brackets of brass, pierced with the most careful attention, by a conical opening in the hollow rim or moulding of a socket, made to receive a stone; the projecting part of the stone in which this plate is fixed being beaten down, and the border of it made hollow, that the whole plate might be always illuminated by the sun at noon; its height, upwards of two hundred and seventy-seven feet, Paris measure, above the pavement of the church; the diameter of the hole, which is less than the two thousandth part of its height; the circular marble fixed in the pavement of the church, in order to receive the projection of the sun's shadow, in the summer solstice; the observation made on this marble, in 1510, attested by an inscription which is still legible: all these circumstances denote the capacity and great views of the author of this work.

His

sented with so much exactness, the work so natural, and yet so fine, that a curious man might find entertainment for many days, if he would examine them with a critical nicety.

His imperial Majesty, having been lately informed of the importance and utility of this meridian, to the progress of astronomy, gave orders for its restoration ; and Father Ximenes, the Jesuit, professor of mathematics, and now geographer to his Imperial Majesty, being charged with the execution of the emperor's orders, has since rectified, with a scrupulous exactness, all the parts of the antient dial ; has retraced and repaired the meridional line ; has re-established its level ; has made new solstitial observations ; and has concluded, in short, by a comparison of them with the ancient ones, that the obliquity of the ecliptic was less by a minute and sixteen seconds in 1755, than in 1510. He gives an account of all his labours, in a work published in 4to, in the city of Florence, in 1757, entitled, *The Old and New Dial of Florence*.

The chapel of St. Laurence, in this city, adjoining to the collegiate church of the same name, which is the burial-place of the Medicean family, is universally allowed to be the finest and most costly piece of work in the whole world. This chapel is an octagon, having a spacious cupola for its roof, and its walls are incrustcd with jasper, agate, lapis lazuli, oriental alabaster, and other rich materials. All round it are the tombs of the great Dukes of Tuscany, composed of porphyry, granite, and the most precious marbles ; and on each tomb is a column of jasper, with a ducal crown on the top of it, enriched with variety of jewels.

Above

Above these tombs the statues of the great dukes are placed in niches, all of brass gilt, and large as the life. In the middle of each face of the octagon rises a double pilaster of jasper, and on the pedestal of each are several emblematical figures, curiously wrought with precious stones. The pavement is of the finest marble, and the roof adorned with lapis lazuli, of the brightest blue, and spangled with stars and veins of gold. This splendid and sumptuous structure was begun above an hundred years ago, but is not yet finished, though it has already cost many millions sterling.

The Cathedral of Pisa, is one of the most regular, beautiful, and lightsome pieces of Gothic building to be seen in Europe. The choir is of the finest marble, and the roof is supported by eighty columns of the same stone, all of one solid piece, being part of the spoils taken by the Pisans, in their eastern expeditions, when the republic was in a flourishing condition. The pavement is also of marble, but of different colours, curiously intermixed; and the paintings, especially of the choir, are done by the greatest masters. The three gates of this church, which are of brass, are exquisitely wrought with the history of our Saviour's birth, life, and passion. The baptistery is a fine marble structure, shaped like the cupola, of St. Peter's at Rome, and supported by beautiful pillars.

Near

Near the Cathedral is a round tower, of beautiful marble, ornamented with seven rows of pillars, besides that of the turret. It was built about six hundred years ago, is about four fathoms in diameter, and is particularly famous for its inclination, which makes it look, at first sight, as if it threatened ruin. Some have pretended, that it was built out of design, with this apparent defect, but this ridiculous conjecture is confuted by the slightest attention. All the lintels of the doors are shattered; the bearings of the stone are not horizontal; the greatest part of the ancient towers in Pisa incline in the like direction, several of the upright spurs of the cathedral lean the same way, which proves that the ground-plot of these edifices being built before the use of foundations upon piles, it has verged from the perpendicular: and an evident proof that the ground of Pisa is not solid, is, that the observatory of that city, a very beautiful building, erected a few years ago, on the foundations of an ancient tower, sunk, in the month of March, 1755, upwards of a foot and an half.

M. de la Condamine measured, with a line and plummet, the height and inclination of the tower of Pisa; whence it appears, that the defect of its level is about thirteen feet, Paris measure, which is upwards of two and twenty feet English measure, counting from the foot of the balustrade, placed on the platform, to the foot of the cupola, or little turret

on top, in which are the bells. He found the height of the said platform, above the level of the place, or superficies of the ground, on which the cathedral stands, to be a hundred and thirty-three feet, to which adding about twenty-seven feet more for the height of the turret, which leans more than the body of the tower, eight feet for the depth of the trench; and about two feet which the line measured since the operation, uncharged with any weight. would have appeared shorter; we shall have for the total height of the tower a hundred and seventy feet, Paris measure, on the side where it inclines most, insomuch, that were it set up again, it would be within a very little of 172 feet high *.

Amongst the cathedrals of Italy, that of Sienna in particular deserves attention: this is really a master-piece in the Gothic style, and may be viewed with pleasure, after St. Peter's itself. The walls, both within and without, are faced with marble of different colours; and the roof is azure, sprinkled with stars of gold. The portico of this church is very magnificent; and the whole fabric is adorned with variety of excellent statues, busts, &c. and particularly with the heads of above a hundred and seventy Popes in alabaster.

* A remarkable curiosity of this kind is to be seen in Caerphilly-Castle, in Glamorganshire, in South-Wales, and has been described in Vol. II. p. 133, & seq.

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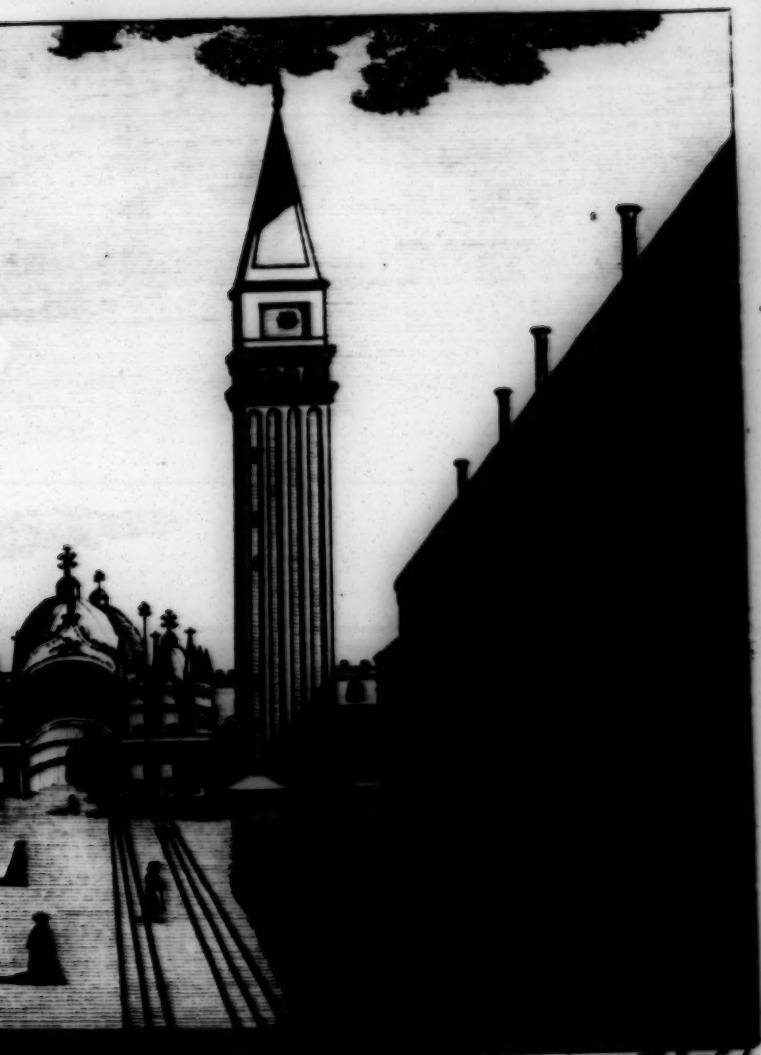
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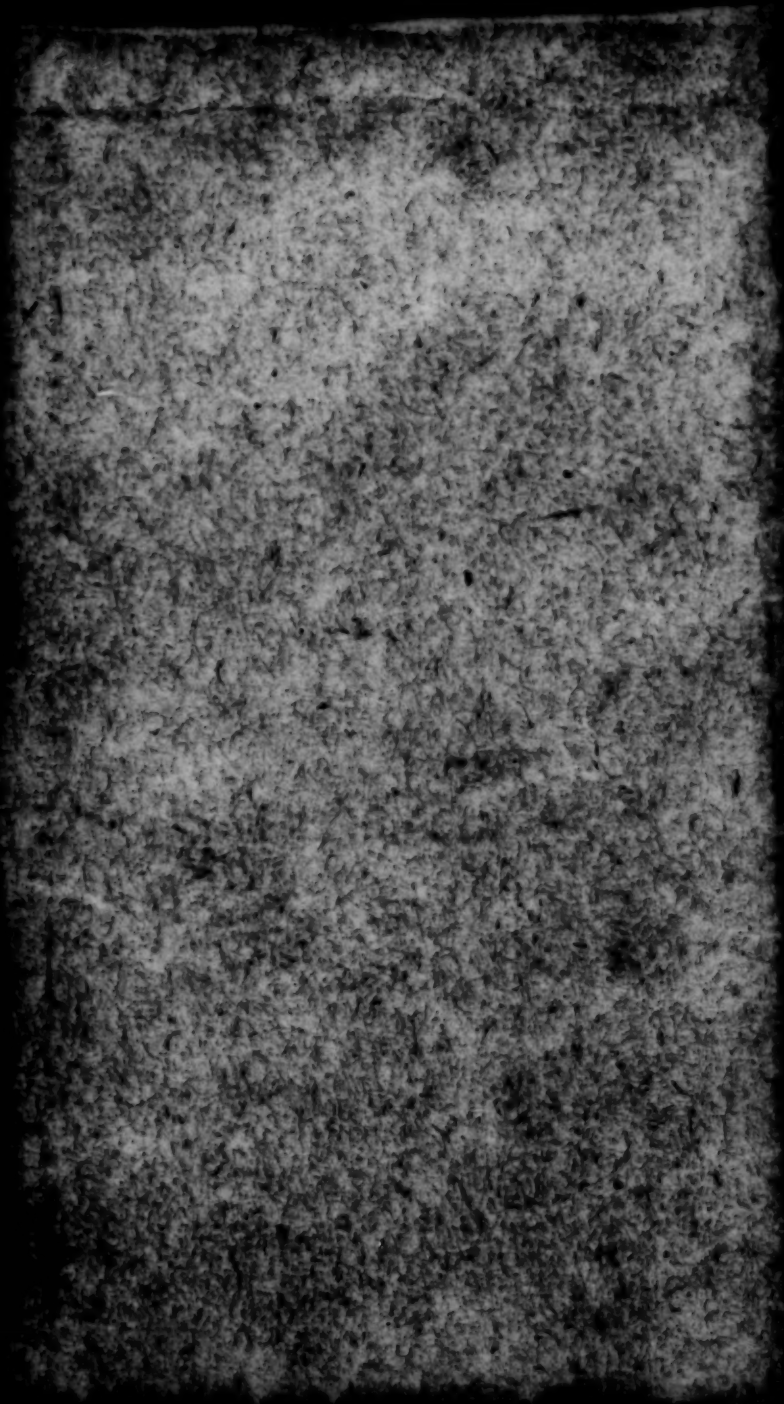


St. Marks Place at V



at Venice

Engraving



The windows are formed by a multitude of little pillars, retiring one behind another, and the large columns are carved with fruit and foliage from the bottom to the very top. But above all, the pavement of the church is exquisitely fine, being composed of marble of various colours, forming a sort of Mosaic work, wherein is represented, in a most lively manner, the story of Abraham going to sacrifice his son, the passage of the Israelites through the red sea, and other histories of the old testament. In order to preserve this beautiful work, they cover it with boards, which are easily taken up to satisfy the curiosity of strangers.

The cathedral church of St. Mark in Venice, is built after the Grecian manner, almost square, and covered with four domes or cupola's; but it is neither very large nor lofty. The whole is supported by thirty-six pillars of fine marble; a beautiful balustrade runs round the top of it, and the frontispiece is adorned with columns of porphyry and jasper. The high altar is a master-piece of its kind, and the back of it is embellished with a vast number of curious pictures, enamelled after the Grecian taste, set in gold, and enriched with precious stones. The great quantity of Mosaic work, with which the roof and pavement of this church is adorned, is very much admired, having now lasted near seven hundred years, without any diminution of its beauty.

The cathedral of Loretto, is a most magnificent fabrick, built in the form of a cross, and adorned with a vast variety of statues and paintings by the greatest masters. The cupola is a bold and lofty one, supported by twelve stately pillars, which are covered with paintings; and the doors of the church, which are said to be of Corinthian brass *, are curiously wrought with bass-reliefs, representing several pieces of scripture history. But this church is most famous for the *Santa Casa*, or *Holy House*, which stands in the middle of it, and occasions a vast resort of pilgrims from all parts of Europe †. This house or apartment is about thirty feet long, and thirteen broad, and the walls appear to be of brick, cemented with common lime and sand; but as to the roof and pave-

* This famous metal is said to have been formed from the immense quantities of gold, silver, and copper, that were melted and run together by the violence of the conflagration, when L. Mummius sacked and burnt the city of Corinth, 146 years before the birth of our Saviour. Those who speak of it accurately distinguish it into three kinds: in the first, gold was the prevailing metal; in the second, silver; and in the third, gold, silver and copper were equally blended.

† This Holy House is said to be the same in which the blessed virgin was born, where she received the salutation of the angel, and brought up her son Jesus, till he was twelve years of age: it is also said, that when the Turks became masters of the Holy Land, it was translated from Nazareth into

pavement, they are acknowledged to be of modern workmanship. At the west-end of it is a little window; and at the east end, over the chimney, is placed a cedar-statue of the Virgin, holding the infant Jesus on her right arm. The statue is about four feet high, and usually adorned with a mantle of gold brocade embroidered with precious stones; and on its breast hangs a rich fleece of jewels, with a collar and cross of the same materials. But the most splendid and costly of all the virgin's array, is her triple crown, which, with a little one for her child, was presented to her by Lewis the Thirteenth of France. They are both of massy gold, and are enriched with diamonds, of immense value, which dazzle the eyes of the beholders. Round the niche, wherein the statue is placed, a row of precious stones of different kinds is so disposed, as to form a sort of rainbow of various colours. Twelve lamps of massy gold, said to weigh thirty seven pounds each, hang before the statue; and before the altar hangs one of a much larger size, remarkable for the excellency of the workmanship, which was a present from the Republic of Venice. This altar, which is of pure

into Dalmatia, by angels, who afterwards carried it cross the Adriatic into the territory of Recanati, a few miles from Loretto; from whence they soon removed it a third time, and lastly fixed it in its present situation. To do honour to this house the stately church was built, in which it now remains inclosed.

beaten silver, was presented by one of the Dukes of Tuscany.

As to the treasury of this celebrated place, it is filled with riches surpassing all imagination. It is a long room, or gallery, with a vaulted roof adorned with excellent paintings; on one side whereof are seventeen or eighteen large presses, with folding doors, the repositories of gold, diamonds, and whatever else is valuable, being the offerings of emperors, kings, princes, &c. for several ages past. Silver, as Mr. Addison observes, can scarce find admission here, and gold looks but poorly among such an incredible number of precious stones. It is surprising to view the costly services for the altar, consisting of lapis lazuli, amber, agate, coral and crystal. In one press, there is a spread eagle covered with diamonds; in another, the images of our Saviour and the Samaritan woman in gold, and there is an altar-piece, enriched with jewels, valued at a hundred and forty thousand crowns. In this treasury are likewise kept the rich habits of the virgin, of which she has a change at least for every day in the year. But it would be endless to enumerate all the valuable curiosities that are heaped up here from all parts of Christendom.

In the city of Naples, there are four principal churches, thirty-two of a lower class, for magnificence, and seventy more of a third rank, together with a vast number of churches
belong-

belonging to convents and confraternities. The magnificence of some of those churches exceeds imagination; their gates, porticos, frontispieces, chapels, altars, and tombs, may be justly looked upon as the finest pieces of architecture in the world. The paintings, statues, vessels of gold and silver, and other church ornaments, are numberless, and of incredible beauty and value. The roofs, wain-scots, and walls, are all covered with pieces of the finest marble, most curiously laid together; or with compartments of excellent joiner's work, adorned with carvings and basso-relievos, gilt, and enriched with the works of the most celebrated painters. There is nothing scarcely to be seen, but jasper, porphyry, and other precious stones, done in Mosaic, of all fashions, and all master-pieces in each kind.

In a cloyster belonging to the stately monastery of the Carthusians in this city, is the celebrated crucifix of Michael Angelo, done, as is pretended, after the life, and from a certain peasant, whom that painter crucified for the purpose. It is painted upon wood, and is about half a foot high. In the convent of the Carmelites, in this city, is exhibited a miraculous crucifix, which is said to have bowed the head, to avoid a cannon-ball shot against that monastery, by order of Don Pedro Prince of Arragon, when he besieged Naples, and for which he was immediately punished: for a cannon-ball being shot from the tower of
the

the monastery, carried off his head ; the prince not having the sagacity of the crucifix, to stoop his head upon the approach of the ball.

But a miracle, for which Naples is famous, is wrought in the cathedral of that city, by the head of St. Januarius, formerly bishop of Puzoli, who suffered as a martyr, by having his head struck off. On the day of that saint's martyrdom, a lady is said to have filled two little vials with his blood, which have been preserved ever since, as well as the head, in a magnificent chapel of the cathedral. These relics are carried in solemn procession on the first Sunday in May, annually ; and on their return, are placed on the altar of the chapel, during high mass ; at which time, the blood in the vials, before congealed and dried up, begins to dissolve and bubble, till it becomes quite liquid. The same miracle is performed upon two other days every year, on the 29th of September, and 16th of December, on the high altar of the cathedral. And if, at any time, this blood fails of dissolving, at its approach to the head, the Neapolitans consider that circumstance as predictive of some heavy judgment from heaven : but when it liquifies regularly, they regard it as a token of the divine favour ; upon which occasion, there are many rich offerings made at the shrine of this saint ; and except the Holy-house of Loretto, it is observed, that there is not a relic in the world which has brought more riches than this into the church : for the quantities of
gold,

gold, silver, and jewels, which have been offered at the shrine of St. Januarius, are truly wonderful.

That there is really such a change in the blood contained in these vessels is beyond all doubt, which change is held in Naples for a supernatural one. The vial is shook for some time, and ordinarily, after several shakings, the matter contained in it appears to liquify. This miracle, which was performed at the desire of the Margravine of Bareith, in 1755, and at which M. de la Condamine was present, is thus related by that gentleman. A vial was brought to the princess, set in a circle of brass, or silver, gilt, and mounted on a pedestal, very richly ornamented, which was surmounted again with a caduceus, in order to distinguish the mounting of this from that of the vial kept in the cathedral. All this apparatus was put into the hands of the princess, from whence it passed into the hands of her husband, the Margrave of Bareith, of our author, and several other persons present.

The vial appeared to be half filled with a grey-coloured fixed mass, or paste, and its sides tarnished with dust. On inclining it alternately several ways, and shaking it for about half a minute, the paste became liquid, and melted, sometimes only partially; and at other times it grew fixed again; and on shaking it anew, was either a shorter or a longer time in liquifying. M. de la Condamine had been an eye-

eye-witness of this supposed miracle on several occasions, not only in presence of their highnesses the Margrave and Margravine, but afterwards more particularly at the keeper's of the machine, where he had all the necessary time to examine it. He observed beneath the vial, two small cones, of he knows not what material, with their points opposed to each other, which he was informed were perforated with a small opening and hollow; the lower one was moveable in such a manner, that its orifice sometimes met with that of the upper cone, and at other times did not; all this was purely accidental, and just as the motion impressed on the vial, caused or not the axes of the two cones to concur. As for the dust which he saw in the vial, he was told, that it was an amalgama of mercury, lead, tin, and bismuth; that the bismuth, which mingles but very imperfectly with the other ingredients, prevented the mixture from becoming an absolute paste; and gave it the form of a powder too thick to pass through the little opening, which communicated with the two cones. Lastly, he was told, that in a circular channel, concealed in the mounting, was contained some running quicksilver; that, by shaking the vial irregularly, when the orifices of the two cones met, this mercury insinuated itself in a greater or less quantity, and liquified the amalgama; that it came to pass sometimes, that by the variety of motions impressed on the machine, the mercury so introduced,

return-

returned again by the same opening, and that then the amalgama ceased to be fluid *.

The churches of Genoa are likewise beautiful and magnificent; the cathedral is a noble structure of white and black marble, intermixed, and all massive square stones. In the treasury belonging to this church, is, amongst other relics, preserved with the greatest veneration, for upwards of six hundred years, a dish, or rather an hexagon bowl, which they pretend to be made of emerald, and in which they pretend our Saviour eat the Paschal Supper. It has two small handles, and consists of one single piece; its greatest diameter is about fourteen inches and an half; its height, five inches nine lines; its thickness, three lines. This monument is kept under several keys, deposited in different hands. When it is shown, which happens but seldom, and by virtue only of a decree of the senate, the vessel is let down by a cord, passed through its two handles, and suspended round the priest's

* Mr. Addison calls this whole affair of liquifying the blood of St. Januarius, one of the most bungling tricks he ever saw; but it were to be wished, that he had shewn us in what particular it was bungling. M. de la Condamine, with that happy curiosity, for which he is so remarkably distinguished, has here explained the whole juggle, upon such mechanical principles, as, though they entirely destroy the credit of the miracle, yet, at the same time, prove the means by which this wonderful feat is effected, to be very ingenious.

neck

neck, who presides at the exhibition, but never goes out of his hands. By an antient decree of the senate, bearing date the 24th of May, 1476, it is forbid, under severe penalties, to approach too near this sacred vessel, and much more to touch it with any metal whatever: but all this apparatus, and these difficulties seem only so many precautions taken against those who want to satisfy themselves by some proof, such as that of a file or graving-tool, whether the matter of which this vessel is composed, be really of the hardness of an emerald.

Nevertheless, they produce an act, by which it appears, that the vessel was pledged by deliberation of the senate, in 1319, during the siege of Genoa, for a sum equivalent to 1200 marks of gold, and that this sum was paid off, and the pledge withdrawn twelve years after, which seems to prove that the great value of the matter of this deposit was, at that time, without suspicion: but the circumstance of one of its handles being cracked, is, perhaps, no presumption in favour of the matter of this vessel, nor perhaps can this proof, which is supposed to have been made in presence of Charles the Fifth, ascertain the genuineness of the emerald.

M. de la Condamine having found an opportunity of examining it, viewed it attentively, opposing it to the light of a large taper; the colour appeared to him of a very deep green.

green. He perceived not in it the least trace of those icicles, straws, clouds, and other defects of transparency, so common in emeralds, and all other precious stones of the least thickness, even in rock crystal : but he distinguished very evidently several little voids, resembling small bubbles of air, of a round or oblong form, such as are commonly found in crystals, or glass, whether white or coloured.

In 1726, a work was published at Genoa, by a religious monk of the Augustine order, filled with historical researches on this subject. The author leaves undecided the question which he proposes to himself, whether this precious moveable was brought by the Genoese from the siege of Cæsarea, in Palestine, in the year 1103 (as appears evident from the testimony of William, Archbishop of Tyre, who lived about four centuries ago) or from the siege of Almeria, taken by the Moors, in 1147; but he discusses, with great erudition, through what hands the vessel has passed, since the Queen of Sheba made a present of it to Solomon, to the time in which it was employed to serve up the Paschal Lamb to our Saviour, on the eve of his passion : this is a point on which our author has not the least doubt. As for what respects the matter of it, he maintains, that it is certainly an emerald, and his strongest argument is, that the matter of a vessel, which served for the supper wherein our Lord instituted the august Sacrament of the Eucharist, could not be too precious. This principle,

once admitted, would lead the author further than he desires, and prove that the dish ought to be a diamond.

The cathedral church of St. Petrona, at Bologna, must, when finished, be a most superb structure. It was begun upon so large and magnificent a plan, that Alberto, a celebrated architect, said, above an hundred years ago, it would not be finished at the end of the world. What is most remarkable in this unfinished structure, is a meridian, traced above a century ago, by the illustrious astronomer Dominick Cassini, which is well known throughout all Europe. It is drawn on a copper-plate, set in the pavement of the church, and is 220 feet in length. The rays of the sun dart upon it from a hole in the roof of one of the side isles of the church; it begins exactly under the hole, and terminates at the bottom of the great nave. It has divisions engraved on it, for the degrees of the ecliptic, with the several signs marked at their proper distances: the hole through which the sunbeams dart upon the line, is about ten inches square, and about ninety feet high above the line.

PALACES, and other REMARK- ABLE BUILDINGS.

THE Pope's palace at Rome, in which he usually resides in the winter, is called the Vatican, and is a large and stately building, but very irregular, consisting of a great number of fine structures, ill disposed and put together. It stands near St. Peter's church, and contains, according to some writers, above twelve thousand rooms, and though the outside has nothing that raises admiration, the inside makes ample amends: for the spectator is astonished at the grandeur of the apartments, and the beauty of the paintings, wherein the greatest masters of Italy have displayed their art. In the Great Hall, or *Sala Regia*, where the pope gives audience to ambassadors, there is an admirable piece of the celebrated Raphael, representing Leo in his pontifical habit meeting Attila, King of the Huns: and Michael Angelo has outdone himself in the conversion of St Paul. The same hand has inimitably drawn the Last Judgment, in a chapel adjoining to this hall, which is likewise admired for the beauty of its structure. The pleasure-house, called the Belvidere, abounds also with excellent paintings, and its gardens are very delightful, being laid out in pleasant walks, and adorned with fountains, cascades, grottos, &c. together with a great variety of antique statues, many of them of excellent

workmanship, particularly that of Venus coming out of a bath, a dying Cleopatra, and Laocoon, with his two sons, and serpents twisting about them, cut out of one block of marble. But the famous library, with the building that contains it, engages the attention of a stranger more than all the other beauties of the Vatican. The structure is finely painted both within and without, and the library itself is perhaps the noblest collection in the world, both of printed books and manuscripts, especially the latter, having been much augmented by the library of the Elector Palatine, from Heidelberg, that of the Duke of Urbino, and that of Christiana, Queen of Sweden. A Hebrew bible; the four Gospels, written by the hand of St. Chrysostom; a Virgil and a Terence, above fourteen hundred years old, are to be seen among the ancient manuscripts, of which indeed there is a surprising number in Hebrew, Greek, Latin, Arabic, Chaldean, and several other languages; some of them remarkable for the curious manner in which they are written, and others for their scarcity and antiquity.

There is belonging to the Vatican, an arsenal, which, it is pretended, contains a sufficient number of arms for 20,000 horse, and 40,000 foot; and from the Vatican there is a communication, by means of a stately gallery, into another palace near it, called the palace of St. Angelo, which has been fortified with four bastions, by Pope Urban the Eighth; and

is now converted into a strong castle, in which the pope's triple crown, and other pontificalia are laid up : it is also a place for prisoners of state.

The Capitol is a modern structure, raised upon the ruins, and even upon some of the foundations of the ancient Capitol, after a design of Michael Angelo. It consists of three separate edifices, one of which, the front structure, is the residence of the Senator, and the other two, which compose the two wings of the front house, are the residences of the conservators of the city.

The several public buildings of this city would require a volume to describe them.

Next to the Vatican, the most celebrated palace in Italy, is the magnificent palace of Pitti, at Florence, belonging to the Grand Duke of Tuscany. It is called also the New Palace, to distinguish it from another palace on the opposite side of the Arno, called the Old Palace. It is built in the rustic manner, which, as well as the Tuscan order of architecture, owes its original to this country. The front towards the street, has a range of twenty-two large windows, in each story, with fine pillars at the sides of them, and other proper ornaments ; but the court, or area within, is too small to view the building to advantage. The Duke's apartments are very richly furnished,

nished, and adorned with exquisitely fine paintings.

From the New Palace, there is a private passage to the Old Palace, by means of a close stately gallery, which runs over the river, and over houses, the length of half a mile. The gallery of this palace is filled with an amazing variety of curiosities, both of nature and art, particularly pictures and statues, perhaps the most curious and valuable in the world. One side of the gallery is a continued window, under which are ranged fine marble statues, of the Roman emperors, and ancient heroes, and above it are the pictures of the most learned men of different ages and countries. The opposite side is covered with the pictures of the Medicean family, and those of the most celebrated generals, ancient and modern. Amongst the busts of the emperors, are those of Caligula, Otho, Pertinax, and several others, which are uncommon, and almost singular in their kind; and many of those which are more common deserve particular notice for the excellence of the sculpture, as those of Augustus, Vespasian, and Marcus Aurelius. There is also an admirable bust of Alexander the Great, looking up to heaven, in whose countenance the sculptor seems to have expressed his concern for want of new worlds to conquer. The entire figure of a vestal virgin, with the sacred fire burning before her, is a curious piece of antiquity; and so is a

Mer-

Morpheus in touch-stone *, being the figure of a boy asleep, with a bundle of poppies in his hand, in which manner that deity is usually represented by ancient statuaries. There are likewise in this gallery, a Narcissus, a Flora, a Gladiator, and many other statues, to the number of three hundred or upwards, valuable for their antiquity and excellent workmanship.

Nor is this all : there are six or seven rooms adjoining to the gallery, which are filled with all manner of curiosities. One of them contains a collection of idols, sepulchral lamps, talismans †, medals, and other antiquities of the like nature.

But

* This is a black, smooth, glossy kind of marble, formerly found in Lydia and Ethiopia, and called by the ancients *Lapis Lydius* and *Basaltus*. The Giant's causeway in Ireland, consists of this marble, See Vol. I. p. 63 & seq. According to Pliny, the famous statue of Memnon, at Thebes, was made of this stone, and most of the antique Egyptian figures are apparently of the same. It is called Touch-stone by the moderns, as being used in trying the goodness of gold and silver.

† Talismans are the figures of the heavenly signs, constellations, or planets, engraven on stone or metal, to which some astrologers ascribe wonderful virtues, particularly that of drawing down the influence of the celestial bodies. There are also magical talismans, which bear very extraordinary

But the most valuable curiosities of this palace, are kept in a magnificent octagonal room, called the Tribune, twenty-four feet in diameter, and covered with an arched cupola: the floor is paved with several sorts of marble, admirably laid together: the walls are hung with velvet, and beautified with an infinite variety of curious ornaments: the windows are of polished crystal, and the inside of the cupola richly inlaid with mother of pearl. Among the curiosities preserved in this apartment, is a large diamond, weighing 139 carats, and valued at about 200,000 l. sterling; an antique head of Julius Cæsar on an entire turquois, about the bigness of a hen's egg; a cabinet full of vessels of agate, cornelian, porphyry, coral, rock crystal, &c. a large table inlaid with oriental, jasper, rubies, topazes, and other precious stones; the labours of Hercules, all in massy silver; two globes of an uncommon size: the celestial, studded with the richest jewels, representing the constellations, and casting such a lustre, as can scarcely be borne by the naked eye. Here is likewise a noble collection of curious pictures and statues, among which is the celebrat-

dinary figures, with superstitious words and names of angels. The ancient talismans of the Samothracians were pieces of iron, formed into images, and set in rings, which were reckoned preservatives against all evils. Some rabbins maintain, that the brazen serpent raised by Moses in the wilderness was a talisman.

ed statue of Venus, commonly called Venus^s of Medicis, the delicate shape and beauty of which, are confessedly beyond description; and in this apartment are also a prodigious number of antient busts and medals.

The Grand Duke has a country palace, called Pratolino, which is a beautiful and majestic structure, but is peculiarly celebrated for its noble waterworks. In the gardens of this ducal villa, is a fine grotto, of which the roof alone is said to have cost thirty thousand ducats, being all of coral, mother of pearl, and other costly materials. The walls are lined with the same materials, and the pilasters are adorned with an organ, which by means of water plays several tunes *, whilst the god Pan joins his pipe to the music, and is an-

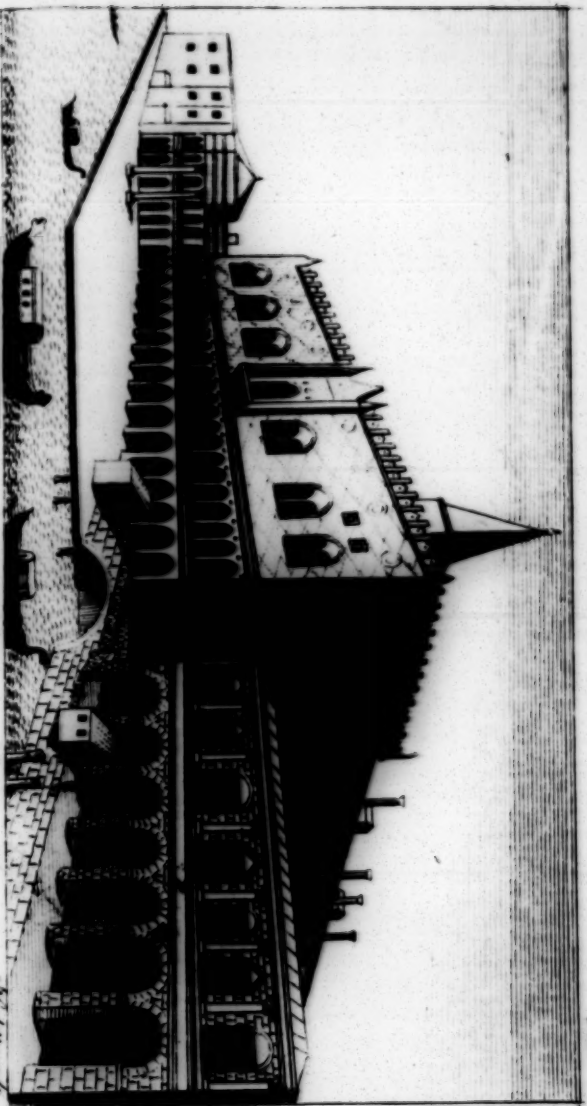
* Hydraulic organs, which play by means of water, are to be seen in several grottos in Italy, from whence they have been introduced into France, and some other countries. The invention however is not modern; for Ctesibus of Alexandria, who lived in the reign of Ptolemy Euergetes, is said to have first contrived organs that played by compressing the air with water, as is still practised. Archimedes and Vitruvius have left us descriptions of the Hydraulic Organ: and we find the figure of one on the reverse of a large medalion of Valentinian, with two men, one on the right, the other on the left, seeming to pump the water which plays it, and to listen to its sound. It consists of eight pipes, placed on a round pedestal.

swered

swered by the warbling of a great variety of artificial birds. In the basin there is a large dolphin carrying a naked woman on his back, and swimming about, with several other figures, all moving as if alive. In another grotto, Galatea comes out of a door in a sea-chariot, and returns again the same way, after having sailed some time upon the water. In one place, an angel plays a tune upon a trumpet; in another, a clown carries a dish of water to a serpent, who lifts up his head and drinks it: here smiths are at work, there mills are a going, and a great many other curiosities of this kind, all moved by water, may be seen in the grottos of these delightful gardens.

The royal palace at Turin, is a beautiful structure, in the modern taste, with a gallery an hundred paces long, to which there is an ascent by a magnificent stair-case, adorned with fine paintings, by the best masters. This gallery is furnished with a variety of curiosities; the apartments are magnificent, and richly furnished, and the great hall is finely painted. Near this metropolis, are several other royal palaces, with fine gardens, and curious water-works.

The Doge's palace, at Venice, is a stately and magnificent Gothic structure, joining to St. Mark's church, and forming one of the façades of a noble and celebrated square, called the Piazza of St. Mark, 280 paces long.



The Doge's Palace at Venice.

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long, and 100 paces broad. The apartments of the Doge's palace are richly furnished, and adorned with the paintings of the greatest masters. The Sala, or great hall of this palace, is the senate-house; it is 60 paces long, and has 2000 seats. Here also is an apartment, called the Hall of the Council of Ten, and the Little Arsenal of the noble, where are fire arms for 1000 men, always charged and primed, besides swords and pikes.

Next to the Ducal palace, the most magnificent is that of the Patriarch of Aquileia, of which the great statuary Sanfovio, wrote a description.

It would be endless to enumerate the sumptuous palaces of Venice, which are reckoned no less than 400, and are sufficient to adorn ten large cities. The number of bridges built over the canals of Venice, is almost incredible, being reckoned no less than 450, all of stone; besides wooden bridges: but the most considerable bridge in this city, is one built over the grand canal, in the middle of the city, called the Rialto, and universally allowed to be one of the finest bridges in Europe. It was built in the year 1591, after a design of the celebrated Michael Angelo; and is said to have cost 250,000 ducats. It consists only of one single arch, all of marble, has rails on each side, and two rows of shops in the middle. The dimensions of this bridge are as follows: the compass of the arch is just one third part
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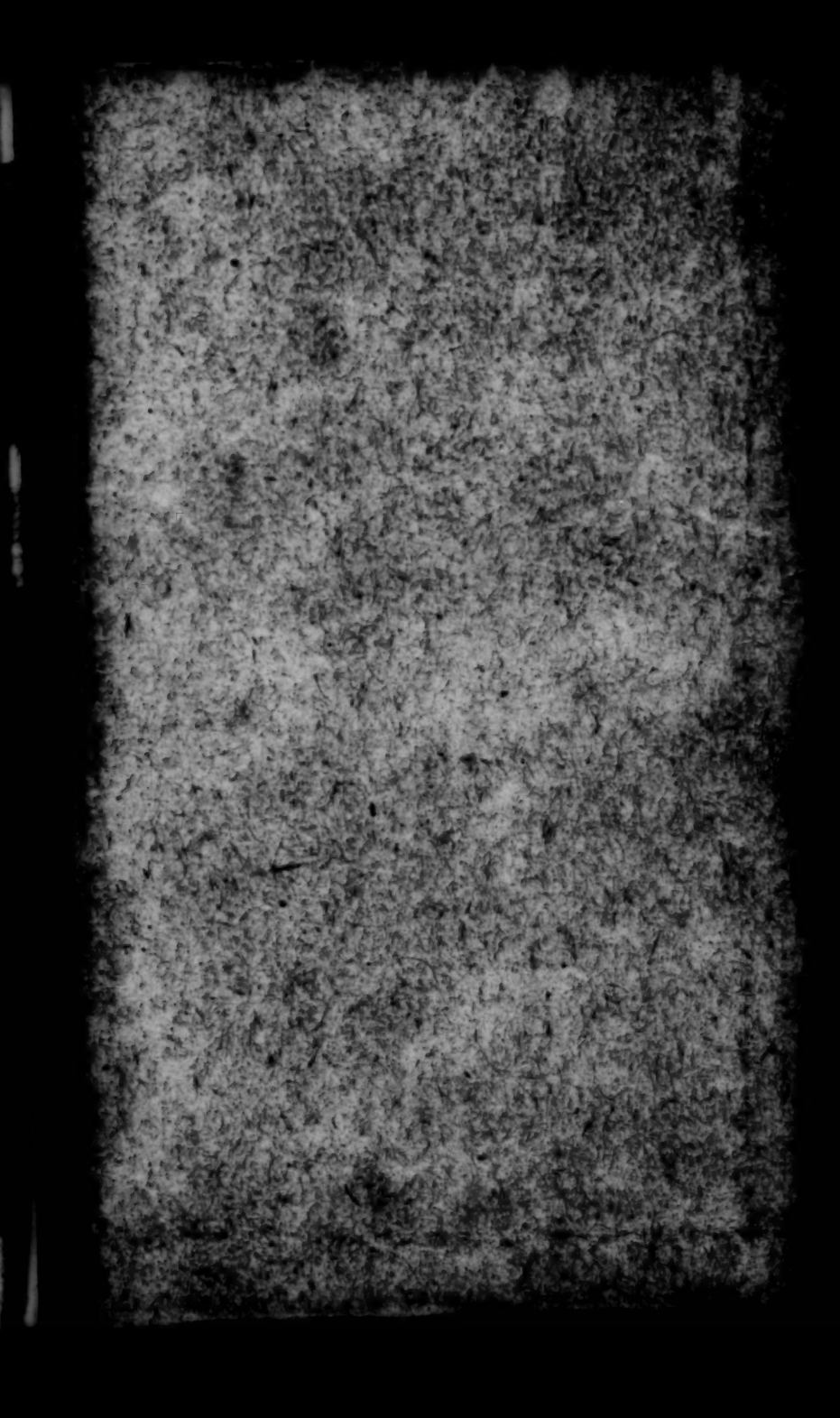
of a circle, the width of it on the level of the water, from one extremity to the other, is 6 feet, and the height of it twenty-four.

Among the stately palaces of Bologna, that of the Pope's legate is the most worthy of notice. It is an admirable structure, richly furnished, with a fine cabinet of curiosities. It has a stately portico, over which is placed a statue in brass, of Pope Gregory the Thirteenth, weighing eleven thousand pounds, and on each side are the statues of two other popes, finely executed.

In the middle of this city, is a leaning brick tower, called the Tower of Asinelli: its form is square, but its base appears much straighter than that of the tower of Pisa. It is three hundred and seventy-one feet high: here also is another leaning tower, called the Garisenda, of the same materials, the same form, and the same diameter, seemingly, as the tower of Asinelli, and appears to the eye to lean no less than the tower of Pisa: but the upper part of the Garisenda is tumbled down, or has been demolished, in order to prevent its fall.

About two miles from Milan, is a noble man's seat, which produces such a surprising echo, as can scarce be equalled in the world. Mr. Addison tells us, that, upon firing a pistol, he had the sound returned fifty-six times, though the air was then foggy, and therefore not proper for making the experiment to the

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A View of the Rialto at Ve



at Venice .

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best advantage ; at first, the repetitions were very quick, but the intervals were greater in proportion as the sound decayed. Nothing like such an echo, it seems, was designed by the architect, but is occasioned by two parallel walls, of a considerable length, between which the sound is reverberated from one to the other, till the undulation is quite spent. Others tell us, that the sound of one musical instrument in this place, will seem like a great number of instruments playing together in concert.

In the city of Orvieto, is a well cut into a rock, at the charge of Pope Clement the Seventh, to supply the city with water. This well is 250 cubits deep, and has a double stair-case, consisting of 550 steps, and enlightened by windows cut through the rock. The mules, which bring up the water upon their backs, go down by one stair-case, and come up by another.



S E C T. VI.

Curious Remains of Antiquity in Italy, and the Italian islands; Remarkable Laws, Customs, and Traditions of the Inhabitants; with a Summary View of the most extraordinary Revolutions among them.

REMAINS of ANTIQUITY.

ITALY abounds with so many noble monuments of antiquity, that a particular description of them all, would greatly exceed the limits projected for such subjects in the design of this work. The brevity necessary to be observed therefore renders such a description impracticable, as well as inconsistent; for which reason, under this head, such monuments only will be taken notice of, as are most curious, and worthy of observation.

The principal remains of antiquity in Italy, are those of Rome, that celebrated metropolis and once mistress of the world, every part of which is filled with evidences of its ancient grandeur.

In 1573, was found in the ruins of a temple of Romulus, which forms at present the church of St. Comus and St. Damien, at Rome, the
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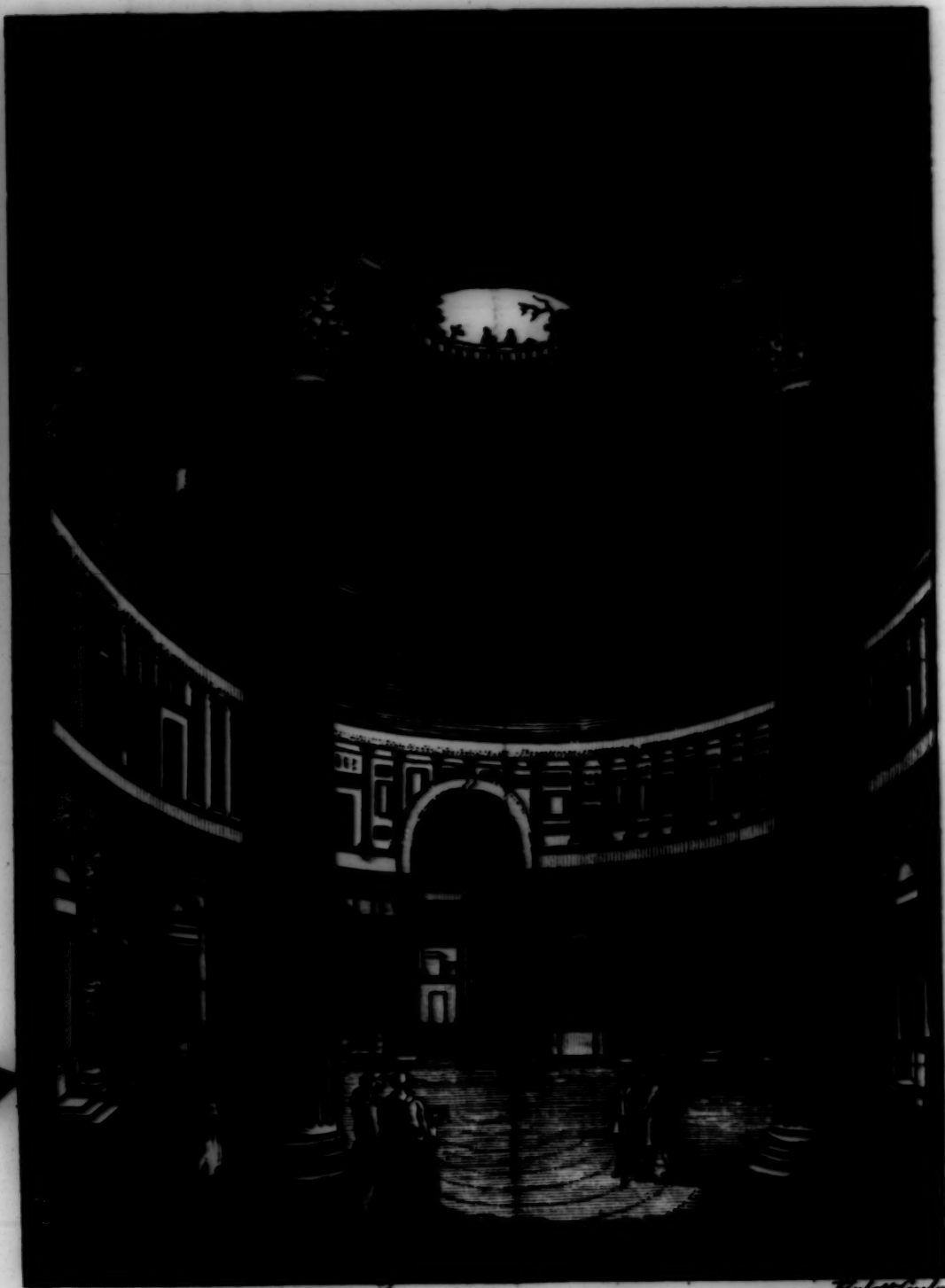
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The inside of the Pantheon, or Rotunda at Rome ^{Hulton-Deput}



shattered remains of a plan of that city, engraved on marble, about the time of the Emperor Septimius Severus. These fragments were lately removed to the Capitol, and divided into twenty-six tables, which at present line the walls of the great stair-case.

Of the Pagan temples remaining in that city, the Pantheon, usually called the Ronda from its circular form, is one of the most entire and beautiful. It is now dedicated to the blessed virgin, and all saints, as it was anciently to all the heathen deities. This temple is a hundred and forty feet high, and about as many in diameter; its roof is vaulted in form of a dome or cupola, but open at top, from whence the structure receives all its light. The walls are lined with marble, and the roof was formerly covered with brass, which was removed by one of the popes, and converted into four wreathed pillars that support the canopy of the high altar of St. Peter's church. The portico is exceedingly majestic, being supported by sixteen tall columns of Egyptian granite, each consisting of one stone, of the Corinthian order; and the gate is forty feet high, and twenty wide. The Pantheon was built by Agrippa, son-in-law of Augustus, as appears by an inscription still remaining over the Portico.

The Temple of Fortune has withstood the injuries of time, and is now a Christian church; as is also the temple of the Sun, or of Vesta,

which is a small round structure, receiving its light from a hole in the top, after the manner of the Pantheon.

The church of St. Stephen, on mount Celio, was formerly the temple of Fannus. It is a large round edifice, supported by two circles of pillars, one within the other, the pillars of the outermost circle being less than those of the innermost, and just twice the number.

Without the walls is the church of St. Constantia, originally a temple of Bacchus, which remains almost entire, and has suffered little alteration. It is likewise of a circular form, sustained by twelve large pillars without, and twelve lesser ones within. The tomb of Bacchus is of porphyry, adorned with vine-branches, boys treading grapes, birds, and other animals, in basso-relievo. The roof is also beautified with Mosaic work, representing bunches of grapes, and several things relating to the vintage: but some suspect these ornaments are not so ancient as the temple itself.

There is scarce any thing standing of the temple of Peace, except three arches; but by tracing the foundation it appears to have exceeded all the other temples of Rome in its dimensions. The largest marble pillar in Rome, of one entire stone, which now stands before the church of St. Mary Maggiore, was taken out of the ruins of this temple.

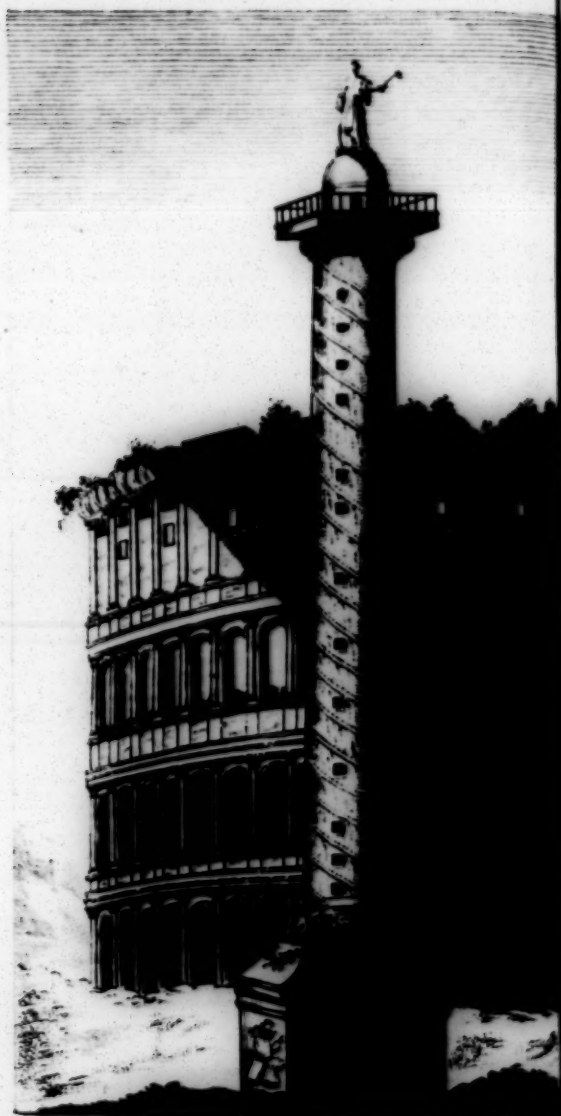
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*Trajan's Pillar, and Titus's
Amphitheatre, at Rome.*

Of the triumphal arches remaining in Rome, there is one very entire, which was erected to Septimius Severus, in memory of his Parthian conquests. It is of marble, and adorned on each side with bass-reliefs, representing the victories of that emperor, and the under part of it is finely wrought with a vast variety of flowers.

But the arch of Constantine the Great, though somewhat broken and defaced, is the noblest structure of this kind in Rome, and perhaps in the whole world. It was erected to him by the senate, on account of his victory gained over the tyrant Maxentius, and was beautified with excellent statues and bass-reliefs, representing his most memorable actions. Several of these statues have now lost their heads, which, it is said, were removed to Florence, by one of the Dukes of Tuscany.

The arch of Titus, erected to him in memory of his taking and destroying the city of Jerusalem, is more defaced than either of the former; but one may still discern upon it a representation of the river Jordan, and many of the spoils of Solomon's temple.

There are four columns in Rome that are remarkable for their antiquity and excellent workmanship, particularly that erected in honour of the Emperor Trajan, which is about a hundred and thirty feet high, exclusive of the pedestal. It consists of large pieces of

white marble, hollow within, and so curiously cemented, as to seem but one entire stone. Within it there is a spiral stair-case up to the top, to which the light is admitted by many little windows; and the outside is adorned with fine bas-reliefs representing the great actions of that emperor. Instead of a golden urn at the top of it, in which the emperor's ashes were deposited, there is now a statue of St. Peter.

The column of Antoninus Pius is taller than that of Trajan, but inferior to it in the beauty of the workmanship. In the room of the emperor's statue, which was formerly on the top of it, there is one of St. Paul. The ornaments on the outside are of the same nature as those on the Trajan column, and amongst other historical pieces there is a figure of Jupiter Pluvius sending down rain on Antoninus's fainting army, and thunderbolts on his enemies; which seems, in some measure, to confirm the story of the Christian Legion*.

The Columna Rostrata is a curious piece of antiquity, having been erected to the honour of Caius Duilius, for a signal victory gained over the

* Ecclesiastical historians relate, that in one of Antoninus's expeditions, when his army was surrounded by the enemy, and ready to perish for want of water, a legion, consisting of Christian soldiers, obtained by their prayers, a plentiful shower of rain, and at the same time, a terrible storm of thunder and lightning, which destroyed
great

the Carthaginian and Sicilian fleets, above 250 years before the birth of our Saviour. It was adorned with the beaks of the vessels taken in the engagement, and has an inscription on its base, but great part of it is not legible.

The Milliare Column, from whence the Romans reckoned their miles, to all parts of Italy, is still to be seen at Rome. It is of white marble, about eight feet high, and formerly stood in the Forum Romanum, but is now removed to the Capitol.

Of the great number of obelisks that were in antient Rome, the most beautiful now remaining is that in the piazza before St. Peter's church, which was already mentioned, and which was brought hither from the Circus of Nero, in the ruins whereof it had lain buried

great numbers of the enemy's army, and made way for a compleat victory. Mr. Addison has given us a translation of a beautiful passage in Claudian, describing the effects of this tempest.

When, with descending show'rs of brimstone fir'd,
The wild Barbarian in the storm expir'd.
Wrapt in devouring flames the horsemen rag'd,
And spurr'd the steed in equal flames engag'd.
Another pent in his scorch'd armour glow'd,
While from his head the melting helmet flow'd:
Swords by the lightning's subtil force distill'd,
And the cold sheath with running metal fill'd.
No human arm its weak assistance brought,
But Heav'n, offended Heav'n, the battle fought.

for

for many ages. It is one entire piece of Egyptian marble, seventy two feet high, twelve feet square at the base, and eight at the top, and is computed to weigh above 478 tons, and supposed to be at least three thousand years old. Notwithstanding its immense weight, it was erected on a pedestal thirty feet high, whereon it now stands, by that celebrated architect Dominico Fontana, in the Pontificate of Sixtus the Fifth, with vast expence and labour, and to the astonishment of all the spectators.

An obelisk which stands before the church of St. John de Lateran, is the tallest in Rome, being a hundred and eight feet high, without the pedestal, nine feet and a half at the base, one way, and eight the other. On each face of it are several rows of hieroglyphics, a sort of mystic figures, or characters used by the antient Egyptians, to conceal the secrets of their theology. It is thought to have been consecrated to the sun, in the city of Thebes, about twelve hundred years before the coming of Christ; and, having been sent to Rome by the son of the Emperor Constantine, was set up in the Circus Maximus, where it was found buried in the ruins, and broken into three pieces. The parts were cemented by the ingenious architect just mentioned, and placed in their present situation.

There is another fine obelisk, which was brought from Heliopolis, in Egypt, and likewise lay

lay a long time broken to pieces among the ruins of the same Circus, till it was joined together and erected in the Piazza del Popoli by the direction of the aforesaid Fontana.

As to the other obelisks in Rome, they are of a smaller size, and some of them seem to be the tops of obelisks broken off; but the hieroglyphics upon them are sufficient proofs of their antiquity.

Of the ancient Theatres and Amphitheatres in this city, we find only the ruins of four remaining, viz. some small footsteps of the Theatre of Pompey, part of the theatre of Marcellus, of the amphitheatre of Statilius Taurus, and of that of Titus, now called the Coliseo, of which there are large remains. This noble structure was not only remarkable for the beauty of its architecture, but for its dimensions and admirable contrivance, having seats capable of containing eighty five thousand spectators. It was of an oval figure within, and adorned with statues, representing the several provinces of the Roman empire, in the middle whereof stood that of Rome, holding a golden apple in her hand.

The Circi were large structures either of an oblong or oval form, built for the celebration of various games and exercises, as has been observed elsewhere; but of these there are scarce any traces remaining. One may just discern indeed the form of the Circus Maximus,

mus, which was built by Tarquinius Priscus, and enlarged to such a prodigious extent, by succeeding princes, as to contain, in their proper seats, two hundred and sixty thousand spectators.

There are still some remains to be seen of several *Thermæ*, or Baths, of the ancient Romans; but the most considerable are those of Antonine and Dioclesian. The ruins of the former look more like those of a town than of a single fabric; and those of the latter are near a mile in compass, which is not to be wondered at, if we consider, that they contained room for three thousand persons to bathe without seeing one another.

The *Aqueducts* were some of the noblest and most useful designs of the Romans, but of those which conveyed water to antient Rome there are only some small parts remaining; except of that called *Aqua Virginis*, which being repaired by Pope Nicholas the Fifth, is still in use, and known by the name of *Fonte di Trivio*. The old aqueduct, which Paul the Fifth restored, brings water from a collection of springs almost forty miles distant from the city.

Of the *Mausolea*, or funeral monuments of illustrious persons among the Romans, there are few in Rome, or its neighbourhood, that are remarkable enough to require a description. That of the Emperor Adrian is now a
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The Catacombs at Naples.



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part of the castle of St. Angelo, but stripped of its statues and other ornaments.

The Tomb of Caius Sestius is a square pyramid of brick, but covered over with white marble; and is still entire, having been repaired by Alexander the Seventh. It is a hundred and twenty feet high, and almost a hundred broad at the base. We enter into it through a narrow passage, which leads to a vaulted room, where we yet discern the figures of women, flowers, vessels, and other ornaments painted on the plaister.

The mention of these sepulchral monuments leads us to give some account of the Catacombs, as they are called, which are a vast number of subterraneous alleys, or galleries, in the neighbourhood of Rome, that appear to have been antient repositories of the dead, but whether originally dug by the Heathens, or the primitive Christians, has been much disputed by the learned. Each alley, or passage, is about four feet broad, and six or eight feet high, and are not only carried on strait forward to a surprising length, but have others running off every way, like so many lanes or streets of a city. On the sides of these alleys were the niches or graves, wherein the dead bodies were deposited, which were laid lengthwise, three or four rows one over another, parallel to the alley. Each of these graves was just capable of receiving one body, and had its mouth closed with large tiles, and
some-

sometimes pieces of marble cemented together in a curious manner *. On some few of these tiles is found the name of the deceased person; but frequently a palm-tree, engraven or painted. In some places, there are little grottos or chapels, hewn out of the rock, going off from the common gallery, which have niches all round them, and are sometimes adorned with old Mosaic work or painting: these seem to have been the burial-places of particular families.

As to the opinion of the primitive Christians digging these caves, and not only burying their martyrs there in times of persecution, but assembling in them for the performance of divine service, it is highly improbable; for as it is not to be conceived how they should carry on such a vast work, unknown to their

* Bishop Burnet, who saw both the Catacombs of Rome and Naples, gives us a particular description of the latter, which are much more lofty and spacious than the former, the alleys being generally about twenty feet broad, and fifteen high; and instead of three or four rows of niches, as in the Roman Catacombs, there are six or seven in those of Naples. But the bishop saw no signs of any thing intended to close up these niches when the bodies were laid in them; so that they must have been very unwholesome stinking places, where some thousands of bodies lay rotting, without any thing to shut in so loathsome a sight and smell, for the niches appear to be too low for coffins.

perfe-

persecuting governors, considering the multitude of hands that must have been employed, and the mountains of rubbish brought out of these prodigious caverns, so likewise it is absurd to think they could hold their assemblies amidst the annoyance of so much stench and corruption *. It is therefore more reasonable to suppose, with protestant writers in general, that the Catacombs were originally the common sepulchres of the antient Romans, and were not used, after the custom of burning the dead was introduced amongst them, unless for slaves, and the meaner sort of people †.

The

* This is the sentiment of the bishop lately mentioned, who tells us he found the streams in the Catacombs of Naples so strong, that though he was as little subject to vapours as most men, yet he had all the day long, after he was in them, which was not near an hour, a confusion, and, as it were, a boiling in his head, that disordered him extremely; whence he infers, that if there is now so much stagnating air there, it must have been much more sensible and intolerable, whilst vast numbers of bodies were rotting in the niches.

The same prelate is of opinion, that the Catacombs were originally the burial-places of the antient Romans: but he thinks it undeniable from genuine inscriptions that have been found in them, that they were used for the same purpose, by the Christians of the fourth and fifth centuries.

† Laying up the bodies in caves, was a very antient way of disposing of the dead, and appears to have been propagated by the Phœnicians, wherever they sent their colonies. When a hero died

The noble amphitheatre at Verona, is the best preserved of any structure of that kind, the inside of it being still almost entire. It is of an oval figure, having forty-four rows of seats of white marble, placed one over another, each being about eighteen inches high, and as much in breadth, so that the whole would conveniently contain 23,000 spectators.

The city of Rimini still shews several monuments of its ancient splendor, particularly a fine marble bridge of five arches, begun by Augustus, and finished by Tiberius. A triumphal arch, built by Augustus, which is likewise of marble, serves at present for one of its gates, though part of it is destroyed. There is also a Suggestum, looking much like the pedestal of a pillar, from whence Cæsar is said to have harangued his soldiers after he had passed the Rubicon.

But perhaps no part of Italy, except Rome, abounds more with remains of antiquity than the neighbourhood of Puzzuoli and Baia, amongst which are several pillars standing in the

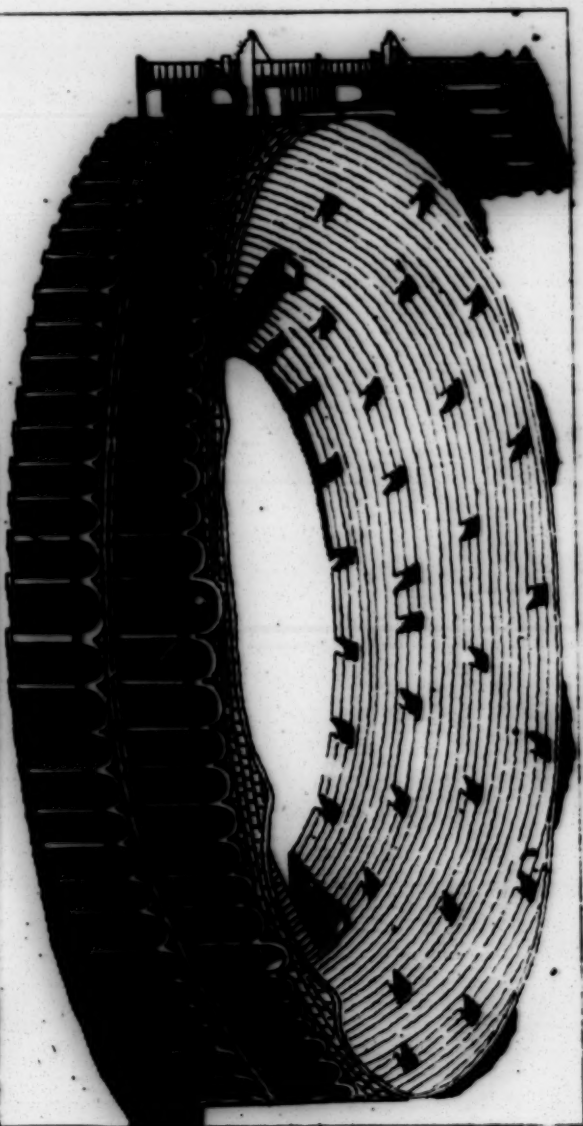
or was killed, in a foreign expedition, it was usual to burn his body, in order to bring home the ashes, and thereby oblige the Manes to follow, that so his country might not be deprived of the benefit of his tutelage. This Mr. Monro thinks was the original of burning the dead, which by degrees became common to all who could bear the expence. As to the present manner of interment, it was first introduced by the Christians.

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The Amphitheatre of Verona

The Amphitheatre of Verona

Handy Guide





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bay, in a great depth of water, which are commonly reckoned a part of Caligula's bridge, though some of our most judicious travellers have made it appear they supported the arches of a strong and stately mole, built for the defence and convenience of the harbour. Be this as it will, the work must have been prodigious; as is also the *Piscina mirabilis*, or *Wonderful Fish-pond*, which seems to have been a reservoir of water, supported by eight and forty large pillars, all hewn out of the rock. It is 150 paces long, thirty high, and forty broad, and is laid over with old plaister now as hard as stone itself. Some ascribe this work to Nero, though others say it was built by Agrippa, to preserve water for the use of his navy.

The other curiosities in this neighbourhood are the *Centum Camerae*, or *Hundred Chambers*, being a great number of large rooms, cut out of a rock, and covered over with plaister; the house and sepulchre of Agrippina, the mother of Nero: the sepulchre of Virgil; the ruins of the seat of Hortensius, of an amphitheatre and a circus; the grottos already described, and many others, on which there is not room to enlarge.

The *Via Appia*, which runs along for about thirty miles, between Rome and Naples, is a noble remain of antiquity. This highway, which was begun in the Consulate of Appius Claudius Cæcus, from whom it takes its name,

extended quite from Rome to Brundisium, now Brindisi, upwards of three hundred miles, and was more frequented by persons of quality among the antient Romans, than any other in Italy. It is twelve feet broad, consisting chiefly of blue stones, of a cubical form, each side measuring a foot and a half. The strength of this pavement appears from its long duration, for it has now lasted above two thousand years, and is for several miles together as entire as when it was first made.

The *Via Flaminia* was another famous road of this nature, extending northwards from Rome to Rimini. Some remains of it are still to be seen, but not so entire as the *Via Appia*, from whence it appears to have been paved with broad flints and pebbles, having on each side a border of stone.

Near the city of Cumæ, in Terra di Lavoro in Naples, is a grotto, or cave, in which the famous Cumæan Sybil is said to have delivered her oracles *. It is hewn
out

* The Sibyls among the antients were virgins supposed to be divinely inspired, who, in the height of their enthusiasm, gave oracles, and foretold things to come. Authors are not agreed about the number of Sibyls, some reckoning three, others four, and Varro ten; but the most celebrated were the Delphic, Erythræan, and Cumæan. The Sibylline oracles were held in great veneration, and the books wherein they were written,
were

out of a rock, is seven hundred feet long, twenty broad, and about eighteen high; and, at the end of this great cave, there is a narrow passage two hundred feet in length, and seven in height, which leads to a kind of apartment, consisting of three little rooms, where are still some remains of Mosaic work, and a fountain of clear water, in which the Sibyl is supposed to have bathed herself. From hence it is said, the cave ran formerly to Cumæ, which is three miles off: but the

were kept by the Romans with infinite care, nothing of moment being undertaken without consulting them. When these prophetesses received their pretended inspirations, their looks grew wild, they were seized with violent tremblings, and all the symptoms of madness and distraction. Thus Virgil describes the Cumæan Sibyl when receiving the divine Afflatus:

— *Subito non vultus, non color unus,
Non comæ mansere comæ; sed pectus anhelum,
Et rabie fera corda tument, majorque videri,
Nec mortale sonans, afflata est numine quando
Jam propiore Dei* ——— *ÆNEID. VI.*

Her colour chang'd, her face was not the same,
And hollow groans from her deep spirit came;
Her hair stood up, convulsive rage possess'd
Her trembling limbs, and heav'd her lab'ring breast:
Greater than human kind she seem'd to look,
And with an accent more than mortal spoke;
Her staring eyes with sparkling fury roll,
When all the God comes rushing on her soul.

DRYDEN.

passage is now choaked up, by the falling in of the rock in several places. The marks of the chissel are still to be seen in all parts of this grotto.

A most beautiful pavement of Mosaic work was found above ground at Frascati, in a house belonging to the Jesuits, called *Rufinella*, which, it is pretended, made part of Cicero's *Tusculum*. Here is also a bust of *Minerva*, armed with a casque and cuirass, much larger than nature, and executed in the grandest manner.

In the Arsenal of Genoa, is still preserved the rostrum, or beak of a Roman ship, made of iron, about a foot long, and resembling a boar's head; and in the same place is also preserved the complete armour of above forty noble Amazons of Genoa, who, having obtained a bull from Pope Boniface the Eighth, between four and five hundred years ago, went armed cap-à-pé to the Holy war, and signalized themselves by their surprising activity and valour.

The subterranean city of *Herculaneum*, buried under the Lava and ashes of mount *Vesuvius*, now for near seventeen hundred centuries, and discovered at the beginning of the last century, is an object on which the attention of the curious has been fixed for many years.

The most valuable, beyond doubt, of all the monuments of antiquity which are admired there, is the great number of manuscripts on Egyptian paper, blackened, and almost calcined, and nearly in the same state as if drawn out of an oven. They have, however, found out the art of unrolling them, and of gluing the leaves on a very thin pellicle; happily they are written but on one side. They are now labouring to transcribe these manuscripts, which it requires only time to do. They will, no doubt, hereafter succeed so far as to interpret them; they are all Greek, and the characters are generally distinct, and read without much difficulty.

Next to the manuscripts, the most striking remains found in this place, are the great number and variety of household utensils, and little family moveables, many of which resemble ours; and it is necessary to remark here, that hardly any but those made of metal would have been able to last so long. Here have been found, among other things of this kind, silver dishes embossed, with their sub-cups in the form of our coffee-dishes. They have found antique drinking-glasses, several of which are of different forms, together with bottles, which alone would prove that the ancients knew how to found and blow glass; and even that they had a sort of white, enough to make window panes of. One step further, and they had discovered, as well as we, the method of rendering blown glass flat, and of making

making it into squares ; nor would they then have remained destitute of that greatest of modern conveniencies, which we enjoy almost without perceiving it, viz. of those windows and glass doors, which let in day-light to us, at the same time that they preserve us from all the injuries of the air ; which exhibit to us, even in the interior part of our houses, the variegated view of nature, and which transform the winds, the frosts, the tempests, into a magnificent moving picture before our eyes.

The Romans, however, were still far from the art of running glass, and making it into mirrors. There was a necessity, first of bringing the matter and the method of fusing it to such a perfection, as that it should imitate crystal ; then to know how to plane and polish this purified glass, before they could think of fixing its transparence by a leaf of tin impregnated with mercury. It appears, that they had not even the art of tinning metals, though they knew extremely well how to apply gold and silver to them. In fact, the statue and horse of Marcus Aurelius, at the Capitol, were gilt ; a great number of family utensils, the very kitchen furniture found at Herculaneum, is frequently silver, but never tinned over. It is the reverse, with respect to solders ; we find none among any pieces of antiquity in silver, but only in tin ; and as this kind of solder is weak, we see nothing more of it than the shattered remains.

In this subterraneous city was found lace made of gold wire. It is of pure gold, and wove like cloth. They had not yet so much as set themselves about thinking how to substitute, instead of a gold thread, a thread of silver gilt, which should be as beautiful, light, and of a price greatly inferior to the other. For a very strong reason, they had never taken any thoughts about sparing again in the materials, without losing any thing in the outward lustre, by making flat the said thread of silver gilt, and rolling it round a silken thread. The Romans were very far from foreseeing, that the time would come, when an ounce of gold would be sufficient to gild a thread of silver six leagues in length.

Among the great number of rings and precious stones set in signets, found at Herculaneum, it does not appear that they have met with one diamond. Very few diamonds are seen that are antique; without doubt, because they have been retailed upon us by the moderns, as fast as they have discovered them. If some of the passages of Pliny and Isidore give us reason to think, that the antients made use of the fragments of the diamond to engrave on hard stones, and to fashion even the diamond itself, it does not appear, that they had made any great progress in the art of bringing the natural facets, or little superficies, to perfection, of multiplying and of polishing them with their own proper powder. The coloured stones found in Herculaneum are mounted in gold.

gold, but very clumsily. Several signets of amethysts have been found here cut in the rounding, to the degree of a drop of tallow on a plane; also some emeralds, some engraven in the stone, others in relief; together with onyxes, cornelians, &c. If we have any superiority over the antients, in the practice of certain arts, it is not at least in that of cutting and fashioning these hard stones: here have been found little vases of rock crystal, the mouth of which is so narrow, that the inside could not have been made hollow as it is, without much industry and patience; and it is doubted, whether, with greater advantages, our workmen would have succeeded better in it. There cannot be any art of more antiquity than this. In the cabinet of Baron Stoch, a celebrated antiquary, at Florence, is a cornelian, fit for setting in a signet, on which are engraved the seven heroes of the antient Theban war, with their names in Greek characters. We know not at present of any precious stone that is engraved of a higher antiquity. It is believed to be of the time of the Trojan war; but the origin of this art is still more antient. It was common in Egypt before the going out of the Israelites, since they had among them lapidaries, and engravers in fine stones, of which we find a proof in Exodus *.

* And thou shalt take two onyx-stones, and grave on them the names of the children of Israel.
 ——— With the work of an engraver in stone, like the engravings of a signet shalt thou engrave, &c. *Exod. chap. xxviii. v. 9, 11.*

In

In the public monuments of antiquity, decency is seldom violated. It is not the same with those designed for the use of private persons, and the interior decoration of their houses. As the Pagan religion was no restraint to debauchery, the ornaments of paintings, sculpture, moulding and carving in the household furniture of the ancients, instead of that seriousness and gravity which our veneration for antiquity leads us to seek for there, frequently present either obscene objects, or the caprices of a wanton and trifling imagination. Among the remains of this kind found at Herculaneum, was a tripod of brass, as remarkable for the beauty of the work, as the impudence of three figures of satyrs, which supported the seat.

Here has been found a little limb of silver, weighing two or three ounces, on which is delineated a dial, or the horary lines: the numbers in it which mark the hours, and the initial letters of the names of the months, are distinctly engraved; the tail of the animal, whose thigh was represented in the limb, served as a pin to the dial. Our author had neither permission nor opportunity to examine for what latitude this dial was made, which was so much the more difficult to determine, as the smallness of the ray did not permit any great precision in the angles.

R E M A R K-

REMARKABLE CUSTOMS.

THE Ecclesiastical day beginning at midnight, throughout the whole Christian world, and all the rites of the Roman church being regulated by it; it is somewhat extraordinary, that the civil day should not commence at Rome with the ecclesiastical; and that Italy alone, with a remarkable singularity, should differ in point of such common practice from all the rest of Europe. The Italians begin counting the hours, in a series of twenty-four, from the end of the day, a time equivocal, arbitrary, and morally impossible to be determined. This whimsical custom favours strongly of barbarism; and from hence it comes to pass, that at Rome, and almost throughout all Italy, they count every day at noon one hour different from the evening before; and that noon-tide, which they, nevertheless, stand in need of knowing exactly, on account of their ecclesiastical rites, varies more than three hours from winter to summer. At Rome, in the solstice of June, at the hour of noon, the clock strikes sixteen; but in the winter solstice, in December, nineteen. As the length of the day, especially when taken from the twilight of the evening before, to that of the next day, differs from one day to another, several minutes, in order to avoid every day meddling with their clocks, they have conceived, that they ought to wait till the differences so accumulated,

mulated, from day to day, should amount to about fifteen minutes ; and that they may act conformably to this regulation, all the clocks of the city make a skip of a quarter of an hour on a day appointed, sometimes at the end of eight days, sometimes at the end of fifteen, and sometimes after an interval of six weeks. For this purpose, a printed almanac informs us, that, from the sixteenth of February, for instance, to the twenty-fourth, it will be noon at a quarter past eighteen, but that on the twenty-fourth, it will be noon at eighteen o'clock precisely, and continue so till the sixth of March, &c. That from the first of June till the thirteenth of July, the hour of noon is to be reckoned at sixteen o'clock ; on the thirteenth of July, at sixteen and a quarter, and so on through the rest of the months, insomuch, that in the space of a whole year, the time of noon varies from fifteen to eighteen ; and that not by an insensible progression from one day to another, but by skipping a quarter of an hour between a fixed day and the day after, at the end of eight or fifteen, and sometimes after an uniform march of forty days.

The Emperor in his Tuscan territories, and the Infant Duke of Parma, in his, have cut, within these few years, this gordian knot, by ordaining, that the hours there should be reckoned conformably to the custom universally received throughout the rest of Europe.

Rome, as well as the greatest part of the cities of Italy, has several literary societies, which go under the name of academies. These sometimes hold public assemblies, where, in many pieces in verse are read, particularly sonnets, a kind of poetry, the taste for which has supported itself in Italy, for upwards of these three centuries past.

At Pisa, is a marble bridge, on which, every three years, is exhibited a singular festival, the origin of which is lost in the remoteness of antiquity. Six hundred and forty champions, divided into two troops, armed with cuirasses and gilt helmets, dispute with each other the bridge with heavy blows of clubs; and frequently they hurl one another into the river, where there are boats ready to receive and succour them. The carnage of the combatants sometimes renders this spectacle tragical.

A custom prevails at Mantua, and some other cities in Italy, of making travellers leave their pistols, carabines, and other arms, at the gate through which they enter; the person who takes charge of the arms, gives the traveller a ticket, like a double tally, one piece of which the stranger keeps, and the other is tied to his arms, which are sent to the gate at which he declares his intention of going out, and there delivered to him, on producing his ticket. This custom was borrowed from the ancient Romans, who, according to Valerius Maximus, had some such ceremony observed in their colonies.

The

The city of Venice has several ceremonies and customs peculiar to itself, the most solemn of which, is that observed upon Ascension-Day, when the Doge, with the utmost pomp, performs the ceremony of marrying the sea, in the manner following. In the morning, three hundred senators, repairing to the Ducal palace in their scarlet robes, accompany the Doge, in all his formalities, to the sea-side, where he goes on board his state-barge, attended by the Pope's Nuncio on his right hand, and the patriarch of the city on his left: the senators follow, and being seated in their places, the admiral, who sits at the helm, makes a signal, upon which the music strikes up, and the slaves begin to row the vessel, which appears to dance to the music. The Ducal barge is followed by a vast number of other barges and gondolas, all decorated in the richest manner, with the foreign ambassadors, nobility, and gentlemen travellers on board; and being arrived at a small island, about two miles from the city, the Doge takes a ring off his finger, and drops it into the sea, repeating the following formula; *Desponsamus te, Mare, in signum perpetui Dominii, i. e. With this ring we wed thee, O Sea, in token of our perpetual dominion over thee.* This ceremony is no sooner ended, than the barges tack about, and row to the church of St. Nicholas, in a neighbouring island, to hear mass; and from thence return in the same pompous manner to the Ducal palace, where the company are magnificently entertained. The solemnity of

the day is concluded by a rowing match of all the barges and gondolas that accompanied the Doge in the morning. They rendezvous upon the large canal of Murano, where being drawn up, in all their splendid decorations, under the sound of trumpets, and other music, they row and jostle one against another, with such force, that many of them turn keel upwards. This whimsical privilege of marrying the sea was granted to this republic by Pope Alexander the Third, for their good offices in raising him to the pontifical dignity.

The Carnival is another diversion peculiar to this city. It always begins on the second holiday after Christmas, and lasts till Lent, during which time, there is an universal change of dress, customs, and laws; the faces of every body are hid under a whimsical variety of masks; the play-houses and gaming-houses are laid open, all marks of distinction, even of sexes, are set aside, and all move and act upon an equal footing. Constraint, respect, ceremony, care, business, and even virtue, modesty, and decorum, seem banished from society, to give place to joy, liberty, folly, and licentiousness. The piazza of St. Mark, and the other most public parts of the city, are covered with toyshops, and frequented by jugglers, rope-dancers, tumblers, mountebanks, puppet-shows, and fortune-tellers; and the whole city is crowded with courtezans from all parts of Italy. The plays and operas make, indeed, the much finer part of the diversions

versions of this season ; but the custom of going masked, gives such a great handle to indecent liberties, that decency seems to be totally extinguished. The assemblies called *Ridotti*, where they play at Basset, are opened, at the same time with the theatres. Ten or twelve rooms may be sometimes seen with gaming tables in each, crowded with gamblers masked, with ladies of quality and courtezans. They have also certain rooms, where liquors and sweetmeats are sold. Every person thus masked, provided he is well dressed, has the liberty of talking to the ladies, even of the highest quality ; no body, not even the husband himself, taking notice at that time of what is said to his wife, because the mask is sacred. But no mask must wear a sword.

These extravagant diversions are said to be permitted by the senate of Venice, to divert the people from feeling the heavy burden of their government, which, without such amusement, it is supposed, would be intolerable : but the true motive seems to be, the vast number of strangers, who come from all parts of Italy, to partake of the diversions of the Carnival, and bring great sums of money to the place ; there being sometimes no less than seven or eight sovereign princes, and between thirty and forty thousand other foreigners at Venice to see these diversions.

Another diversion peculiar to this city, is their bridge battles, which are fought only hand to

list, one parish or ward against another, upon the bridge that parts them, and as those bridges have neither battlements nor rails, they frequently throw one another into the canal: and sometimes one man in the fall draws his antagonist after him, and perhaps two or three more are by the same means drawn after them. But a diversion practised in several parts of this city on Holy Thursday, is still more peculiar to the Venetians, though not unknown to the ancient Romans, as appears from Claudian. It is as follows: A set of men, by the help of a number of poles, which they lay across each others shoulders, rear themselves up into a kind of pyramid, of four or five stories or rows of men, rising one above another; and their weight is so equally distributed, that every man is very well able to bear his share of it; these rows growing less and less, as they advance in height, a little boy crowns the pyramid, who, after some little time, leaps down, and is caught in the arms of one of those on the ground, and is followed by all the rest, one after another, till the whole structure is fallen to pieces.

In their marriages, the Venetians regard only riches or connections; and in general, the persons to be married, never see one another till they come before the priest. To prevent young noblemen, and gentlemen of fortune marrying too soon, or falling into worse disasters, their mothers make no scruple to hire one or two concubines for them at a time; and

a man

a man that has a mind for one or more handsome girls, may be readily supplied, with great choice, even by the girls own mothers, who expose their daughters to open sale.

There is a dance peculiar to Muglia in Istria, which is performed on the last day of the Carnival, and is called the dance of the Green. The men in one group, and the women in another, are crowned with garlands; and holding a bow in their hands, begin to join each other; and by many whimsical kinds of evolutions, by which the one passes under the bows of the other, the male troop first surrounds the females; after which, by the like motion, these surround the other; and from thence intermingle each man to a woman, and knit themselves so within each others bow, that one would think it impossible for them to disentangle themselves, without losing their hold: but yet they do it, by some fresh evolutions, with surprising ease and swiftness, after which each sex repair to their opposite stations.

R E V O-

REVOLUTIONS *and other* MEMORABLE EVENTS.

Celebrated as this country is, historians have given no certain, nor even probable reasons for its being called Italy. Indeed it was not antiently comprehended under any one common name; for, being cantoned into a variety of small sovereignties, with a name appropriated to each, the country in general was then only known by the names of its several provinces or divisions.

Savoy, was originally possessed by the Allobroges, the Centrones, and other barbarous people, as the Romans stiled them. Part of them were subdued by Terentius Varro, and the remainder by Augustus, who formed them into a province; and when the empire was over-run by foreign nations, Savoy suffered the common fate, sometimes subject to one, sometimes to another.

About the year 999, Berold, the son of Hugh, Duke of Saxony, went into Italy with his uncle the Emperor Otho the Third, who conferred upon him the government, and soon after the sovereignty of Savoy: from which period, to the year 1690, nothing entertaining or remarkable is to be found in the history of this part of Italy.

In the year 1690, the Duke of Savoy entered into the grand alliance, when the confederates supplied him with a considerable body of troops, besides large remittances of money, to enable him to make head against the French: but in this war, he was generally unfortunate, particularly in 1693, when the French obtained a complete victory, and Duke Schomberg, General of the English auxiliaries, was mortally wounded.

In 1696, he concluded a separate peace with France, in consideration of their restoring to him most of the towns taken from him during the war. It was also stipulated that the Duke of Burgundy should marry his daughter, and that the French refugees should be all banished from the territories of Savoy. Upon the death of Charles the Second, King of Spain, he joined the French, and with their assistance, endeavoured to prevent the Germans, under Prince Eugene, penetrating into Italy. But when the Germans had passed the Alps, he began to listen to proposals made to him by the allies. Lewis the Fourteenth, having received some intimation of this, imprisoned many of his troops; whereupon the Duke seized the ambassadors of France and Spain, with all the French at Turin. He was resolved to adhere to the allies, and to make as good a stand against France as he could. Prince Eugene, who commanded the Emperor's army in Lombardy, sent him, from time to time, such small detach-

detachments as he could spare, which served as a sort of flying camp, and harrassed the French while they beleagred his towns, but could not prevent their success in almost every attempt. Verceil, Suza, and Ivrea surrendered in the year 1704, and Verue, after a six months siege, in 1705. But these fortresses were so well defended, that the French suffered considerable loss, and the Duke thereby gained time till the confederates could march to his assistance.

On the 3d of June 1706, the French laid siege to Turin, and on the 28th of August following, the Duke of Savoy was joined by Prince Eugene, with the main body of the Imperial army. On the 7th of September they attacked the enemy before Turin, with their united forces, and gained a complete victory. The same day, the duke entered his capital in triumph, which was now reduced to the last extremity, having endured a siege of three months, and consumed very near all their ammunition and provision. At this battle, the Duke of Orleans and Marshal Marsin, who commanded the French, were wounded, and the Marshal died in three days after. The allies took an hundred and fifty pieces of cannon, and seven thousand prisoners; whereupon not only the towns in Savoy and Piedmont, which the French had taken, were immediately reduced to the obedience of the Duke of Savoy, but the Imperialists became masters of the Milanese,

lanese, and drove the French entirely out of Lombardy.

In 1707, Count Taun, the Imperial general, marched with fifteen thousand men into the kingdom of Naples, which he conquered without much bloodshed. The Duke of Savoy and Prince Eugene, at the same time, marched into France with an army of forty thousand men, and in conjunction with the confederate fleet, commanded by Sir Cloudesly Shovel, laid siege to Toulon, but the taking of it being found impracticable, the duke returned into Italy before the end of a month. On the conclusion of the peace in 1713, the allies, in consideration of the services he had performed, and the hazards he had run in the confederate cause, conferred on him the kingdom of Sicily, to which the king of Spain gave his consent, on condition of his Sicilian Majesty's entering into a firm alliance with him.

In 1718, the Marquis de Lede invaded Sicily, with eighteen thousand Spaniards, and most of the towns submitted to him and acknowledged the sovereignty of king Philip. Great Britain, France, and the emperor, immediately entered into an alliance, which, upon the States General coming into it, obtained the name of the Quadruple alliance. By this treaty, they agreed to see the peace of Utrecht performed in all its articles, except such as might be altered by their unanimous consent. The King of Spain, overpowered by the Imperialists and
their

their allies, agreed to evacuate the islands of Sicily and Sardinia, to acknowledge the emperor's title to one, and the King of Sardinia's to the other. His Sardinian Majesty's dominions having enjoyed almost a profound peace ever since the year 1720, many abuses that had crept into the administration during their wars, have been corrected, and trade as well as manufactures of all kinds greatly encouraged. Their laws also, which were extremely voluminous, have been reviewed, and reduced into a narrower compass, by which means, the proceedings in courts of judicature are facilitated, to the great satisfaction and convenience of the subjects.

The territories of the Venetians in Italy, are divided into a variety of provinces; but the duchy of Venice contains almost all the Venetian sea coast in Italy, with the islands, lakes and marshes. They boast that their government has lasted upwards of thirteen hundred years; but their state has certainly undergone many changes and revolutions in that time.

About the year 1325, the great council, which was then composed of the chief citizens, passed an act for reducing their number, and vesting the sovereign authority in certain families and their issue male, who at the age of twenty-five were to be introduced into the assembly, without any election, or any other form than that of proving their legitimacy.

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This body of men have long since assumed the title of noble Venetians, who look upon themselves to be at least equal to the electors of the empire, and but one degree below kings ; for which reason, they seldom travel into foreign countries, where they must have the mortification of being considered merely as private gentlemen.

About a century ago, it was computed there were about five and twenty hundred of these noble Venetians who had voices in the great council, but their numbers are now much reduced, notwithstanding the increase of families ; for during their war with the Turks in Candia, when their treasury began to be exhausted, and on other exigencies of the state, they permitted merchants and opulent citizens, and even some foreigners to purchase the honour of nobility, and consequently a seat in the great council, for themselves and their heirs. The order of nobles, is usually divided into four classes. First, Those twelve families that were really noble, before the institution of the commonwealth. Secondly, Such as were registered, when the members of the great council were limited. Thirdly, Such as have purchased their nobility. And Fourthly, Those who have been created noble in reward for distinguished merit.

The Duchy of Mantua, in the year 1100, was by some leading men of the country, erected into a government of its own, and ren-

dered independent of any foreign power. But their liberties soon decayed, and Mantua became subject to several tyrants; the last of whom was however deposed in 1328, by Lewis de Gonzaga, who obtained the sovereignty as vicar of the empire. His successors enjoyed the title of Lords of Mantua, till the year 1435, when the emperor honoured them with the title of Marquis; and Charles the Fifth, afterwards, conferred that of Duke, on Frederick the Second. The duchy continued in this branch till 1627, when Vincent the Second dying without issue, his cousin Charles Gonzaga, Duke of Nevers in France, by the assistance of Lewis the Thirteenth obtained the duchy. His grandson Ferdinand Charles the Fourth, adhering to the French king in the wars of those times, was proscribed by the emperor, who seized the duchy as a forfeited fee; and the duke dying in 1708, without issue, it fell into the possession of his Imperial majesty.

The Duchy of Parma was antiently inhabited by the Tuscans, and above an hundred years before the birth of Christ, a colony was established there, by the Romans. Upon the declension of the Roman empire, it became subject to the barbarous nations that invaded Italy; but it was again reduced to the power of the see of Rome, by Pope Julius the Second.

In the year 1545, Pope Paul the Third, created his natural son Peter Lewis Farnese, Duke of Parma and Placenza, but the emperor disputed his title, till his son Octavio Farnese married Margaret of Austria the emperor's natural daughter, which confirmed this duchy to the Farnesian family, though the emperor still looks upon it as a fief of the empire, and revertible to him in failure of male issue. The Pope, on the contrary, claims it as a fee of the Holy See, and actually receives ten thousand crowns per annum of this prince.

Genoa, which was the antient Liguria, fell under the dominion of the Romans, with the other parts of Italy. The city was taken at that time and destroyed by Mago, the brother of Hannibal, but was rebuilt by Lucretius, under the consulship of Servilius Scipio and Nepos. Upon the revolution of the Roman empire, it became subject to the Lombards; after which, the Genoese erected governments of their own, but were so tumultuous and unsteady, that no state has ever undergone greater changes. They were successively subject to the Archbishop of Milan, the French, the Marquis of Montferat, the Duke of Milan, and again to the French; and in the intervals of these foreign governments, they chose counts, consuls, and captains of their own.

At length, in the year 1518, Andrew Doria settled it as a republic, in which form it has continued ever since. Doria was one of the greatest admirals and generals of that age; he had served alternately in the Spanish and French armies, and had the address to play one of those powers so successfully against the other, that he entirely disengaged his country from a dependance on either of them, and erected a free state notwithstanding the Genoese offered to make him their hereditary prince; but so jealous was he of their liberties, that he procured an act of state, that neither he, nor any of his descendants, nor any other powerful family in the commonwealth, should be admitted to any office or share in the government, lest they should usurp the sovereign power.

In the year 1547 however, a popular citizen, named Fiesco, obtained such an influence over the people, by his art and munificence, that he almost effected a revolution of the republic. He prevailed upon the citizens to imprison the principal senators under pretence of mal-administration, and created an ill opinion in the people, of their admired protector Doria, the only man whom he apprehended able to frustrate his designs, and in a little time he made himself master of the city. But going the same day, in triumph, to take possession of the fleet which lay at anchor in the harbour, and walking over a plank from one vessel

vessel to another, he dropped into the sea, and being loaded with his armour, was drowned ; this accident threw his party into immediate confusion, of which the aged Doria took advantage, and became a second time the founder of the commonwealth. Fiesco's body being afterwards found, the senate decreed that it should be carried several leagues off, and with ignominious ceremonies thrown into the sea ; that his estate should be confiscated, his palace demolished, and the ruins remain a monument of his treachery ; which they do to this day. On the contrary, fine marble statues were erected on each side the stairs of the senate house, in memory of the patriotic virtue of Prince Doria, and his nephew, who was killed in opposing the usurper.

That part of Italy, which is now known by the name of Tuscany, was antiently called Umbria, Tyrrhenia, and Hetruria. It was divided into twelve principalities, each of them governed by their respective sovereigns, till it fell under the dominion of the Romans at the time of the general invasion. Florence, the capital city, was then destroyed, and not rebuilt till near two hundred and fifty years after. During the disputes between the Emperor and the Pope of Rome, the cities of Florence, Pisa, and Sienna, threw off the subjection of both, and erected such governments for themselves as they thought fit. Their constitutions however were continually

varying as the nobility or people prevailed, till some of the most popular noblemen in Florence assumed the government of that city, and reduced it to the form of a monarchy. The aspiring citizens brought about frequent revolutions at different periods; but at last the house of Medicis had the good fortune to fix the government in their own hands, and they still continue sovereigns of the greatest part of Tuscany, having also reduced the republics of Pisa and Sienna to their dominion.

Rome, the metropolis of the Pope's dominions, and antiently of the Roman empire, derived its name from Roma, a Trojan lady, or, according to others, from Romulus the founder. The second of the Pope's palaces, is that of Monte Cavallo, or the Quirinal, where he usually resides in the heat of summer, said to take its name from two gigantic statues of Alexander, with the Bucephali, erected before the gate, the works of the celebrated Phidias and Praxiteles, and presented by Tyridates, King of Armenia, to Nero. The third palace is the Capitol, which is filled with some of the most exquisite paintings, statues, and other curiosities. These are the chief palaces in the Pope's territories; but as Rome is the principal city in the Pope's dominions, it is necessary to give a brief abstract of its history.

Romulus

Romulus is supposed to have begun his reign about the year of the world, 3300, and to have reigned thirty-seven years. To him succeeded Numa Pompilius, who reformed many barbarous customs, and established religious rites.

In 3381, Tullius Hostilius, his successor, regulated the military discipline. He was killed, after a reign of thirty-three years, by a thunderbolt; and was succeeded by Ancus Marcius, as guardian to the children of Hostilius, but procured himself to be declared king; after which he subdued some tribes of the Latins and incorporated them with the citizens of Rome. He extended his conquests as far as the Tuscan sea. Tarquinius Priscus, in 3437, is said to have been the first of the Romans that wore a crown. He increased the number of the senate to an hundred, and the Roman knights to three hundred; appointed the Fasces to be carried before the magistrates, to distinguish them from the common people. In his reign the Gauls made themselves masters of that part of Italy, which lies on each side the Po, which thereupon obtained the name of Gallia, and is at present called Lombardy.

In 3521 reigned Tarquin the Proud, who was the last of the Roman kings. The Consular government began about the year of the world 3545. The consuls, who presided in
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the senate, were annually elected. The Sabines and Latins in their wars with Rome, were extremely weakened by their own divisions, particularly when Appius Claudius deserted to the Romans and carried over with him five thousand families at once. The Equi and Volsci, the bravest of the Latins, carried on the war however, several years, with various success, but were at last entirely subdued by Lucius Quinctius, the celebrated dictator, who was taken from the plough but a little before he obtained that signal victory. The Veii who inhabited Tuscany, for a long while contended with the Romans for empire, but having lost several material battles, and at last shutting themselves up within their own walls, after enduring a siege of ten years, were forced to surrender to Camillus the Roman general.

In 3666, the Gauls laid siege to Rome, and would have taken it by stratagem in the night, if they had not been discovered by the cackling of some geese. The brave Manlius immediately made a sally from the fort, while Camillus attacked the Gauls in the rear, with an army of twenty thousand men, and entirely defeated them. After this, the Samnites, being apprehensive of the growing power of the Romans, entered into a war with them, which was supported with various successes for near fifty years, when the Samnites were subdued by Papirius Curtor. The city

city of Tarentum on the Adriatic sea, with their confederates under the command of Pyrrhus King of Epirus, were the next that attacked them ; but the Romans gained several compleat victories, and at last entirely conquered the southern part of Italy. This happened about four hundred and forty-seven years after the building of Rome, and in the year of the world 3777.

In the year of Rome 660, the Roman empire began to be distracted with civil wars, Marius being at the head of one faction, and Sylla of the other. The faction of Sylla at length prevailed, and he procured to himself the title of perpetual dictator, by which he was invested with the sovereign power, and subject to no controul from the senate or the people ; a power which, however, he did not abuse, for having regulated the government according to his mind, he laid down his command, and retired from public business.

Ever since the destruction of the Lombards, which was in the year of Christ 774, the Pope has maintained his sovereignty over the city of Rome, and territories thereto belonging. At the time of the reformation, he lost great part of his power and influence ; but he still continues a very considerable temporal prince ; and is absolute in his own dominions. The Campania of Rome is under the Pope's immediate

mediate government. The other provinces of the ecclesiastical state, are governed by legates and vicelegates, and he has a commander in chief of his forces in every province. It is computed that the monks and regular clergy, who are absolutely at his command, are not fewer in number than two millions, and these are dispersed through almost every country in the world, to assert his supremacy over princes, and promote the interest of the Roman catholic church.

The little republic of St. Marino has enjoyed its liberties thirteen hundred years. It was founded by Marino, a hermit, whose reputation for sanctity, obtained him a sufficient number of followers, to enable him to form this independant state.

Lucca is another small republic of about three hundred years standing: the people purchased their independency of the Emperor Rodolph, for ten thousand crowns, and have continued free ever since.

Naples, upon the declension of the Roman empire, fell into the hands of the Goths; but they were in a few years dispossessed by the Lombards, who remained masters of it, till they were driven out by Charlemagne about the year 800.

In the year 1166, the Pope created the Earl of Anjou, King of Naples and Sicily;
but

but in 1504, the Spaniards entirely conquered this country, and it continued under the sovereignty of the Kings of Spain till 1707, when the Spaniards were expelled by the Imperialists, and by the treaty of Utrecht, Naples was confirmed to the Emperor Charles the Sixth.



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THE
BEAUTIES
OF
NATURE AND ART
DISPLAYED;

IN A
TOUR through the WORLD.

CHAP. V.

OF
GERMANY, BOHEMIA, HUNGARY,
and SWITZERLAND.



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C H A P. V.

Of GERMANY, BOHEMIA, HUNGARY, and SWITZERLAND.

S E C T. I.

A general Account of Germany, Bohemia, Hungary, and Switzerland.

THE empire of Germany, the kingdoms of Bohemia and Hungary, and the thirteen cantons of Switzerland are situated between 5 and 23 degrees east longitude, and between 45 and 55 degrees north latitude.

The greatest length of the empire is, from Stralsund in Pomerania, in the north, to the frontiers of Carniola and Istria in the south, 600 miles; its greatest breadth, from the town of Spa, in the bishopric of Liege, in the west, to the confines of Poland, in the east, is about 500 miles. It is bounded on the north, by the German ocean, Denmark, and the Baltic; on the east, by Poland, Bohemia, and Hungary; on the south, by the Alps, which di-

vide it from Italy and Switzerland ; and on the west, by France and the Netherlands.

The kingdom of Bohemia, with Silesia and Moravia, lies between 12 and 19 degrees east longitude, and between 48 and 52 degrees north latitude : its greatest length is 300 miles, and the greatest breadth 250. It is bounded on the north by Saxony and Brandenburg ; on the east, by Poland and Hungary ; on the south, by Austria and Bavaria ; and on the west, by the palatinate of Bavaria.

The kingdom of Hungary, with Transylvania, Sclavonia and Croatia, all subject to the house of Austria, lies between 16 and 25 degrees of east longitude ; and between 45 and 49 degrees of north latitude. It is bounded by Poland on the north ; by Turkey, on the east and south ; and by the German empire on the west : its greatest length, from east to west, is about 400 miles, and its greatest breadth, from south to north, 270 miles.

Switzerland, with the countries of the allies and subjects of the Switzers, is situated between 6 and 11 degrees east longitude, and between 45 and 48 degrees of north latitude. It extends in length 260 miles, and in breadth 100 miles ; and is bounded by Alsace and Swabia, in Germany, on the north ; by the lake of Constance, Tyrol, and Trent, on the east ; by Italy, on the south ; and by France, on the west.



The

The German empire is generally divided into nine circles. 1. Lower Saxony, 2. Upper Saxony, and 3. Westphalia, in the north. 4. Lower Rhine, 5. Upper Rhine, and 6. Franconia, in the middle. 7. Swabia, 8. Bavaria, and 9. Austria, in the south.

1. In the circle of Lower Saxony are comprehended the duchy of Holstein, partly subject to the King of Denmark, and partly to the Duke of Holstein. Its chief cities are Kiel, in Holstein proper, subject to the Duke of Holstein; Mildorp, in Ditmarsh, and Gluestat, in Stormaria, subject to the King of Denmark. Hamburgh, an imperial city, in the sovereignty of Hamburgh; and Lubec, an imperial city, in East Wagerland; the duchy of Lawenburg, subject to the Elector of Hanover, whose metropolis is Lawenburg.

The electorate of Brunswick Lunenburg, or Hanover, containing the principality of Grubbenhagen, the duchy of Hanover, or Calenburg, the duchy of Brunswick Lunenburg, which comprehends Zell, and is therefore called Lunenburg Zell; the duchy of Saxe Lawenburg, the duchy of Bremen, the duchy of Gottingen, and the duchy of Ferden, all subject to the Elector of Hanover. The chief towns of this electorate are Hanover, the metropolis; Grubbenhagen, Lunenburg, Bremen, Gottingen, and Ferden. The duchies of Brunswick and Wolfenbutterle, and the counties of Blakenburg and Rheinsteen, subject to the Duke of Brunswick

Wolfenbüttele. The chief cities are Brunswick, Wolfenbüttele, Blankenburg, and Rheinfelden. The duchy of Mecklenburg, divided into the duchy of Swerin, and the duchy of Güstrow, subject to their respective Dukes, contains the cities of Swerin, Wismar, Güstrow, and Rostock. The duchy of Magdeburg, subject to Prussia, contains the city of Magdeburgh, the bishopric of Hildesheim, containing the imperial city of Hildesheim, subject to the Elector of Cologne; and the duchy of Halberstadt, subject to Prussia, in which is the city of Halberstadt.

2. In the circle of Upper Saxony, are comprehended Prussian Pomerania, subject to the Elector of Brandenburg. Swedish Pomerania, subject to the Swedes. Brandenburg, subject to its Elector, divided into Altmark, Middlemark, and Newmark. The duchy of Saxony, subject to its own elector. The principality of Anhalt, subdivided into Dessau, Bramburg, Zerbst, Kotten, and Plötzka, each subject to its respective prince. The counties of Mansfeldt, Schwartzburg, Hohenstein, and Belchingen, subject to their respective counts. The landgraviate of Thuringia, subject to the Elector of Mentz. The duchies of Meissen, subject to the Elector of Saxony; and Hall, subject to Prussia. The duchies of Saxe Meiningen, Saxe Naumberg, Saxe Zeitz, Saxe Altenburg, Saxe Weimer, Saxe Gotha, Saxe Eisenach, Saxe Saalfeld, subject to their own dukes, and the county of Stolberg, subject to its own count. The chief cities in this circle, are,

are, Stetin, in Prussian Pomerania; Berlin, Franckfort, and Custrin, in Brandenburg; Dresden, in Saxony; Erfurth, in Thuringia, with many others of no small note.

3. The circle of Westphalia comprehends the county of Embden, or East-Friesland, subject to the King of Prussia. The county of Oldenburg, with Delmonhurst, both subject to the King of Denmark. The bishoprics of Munster, Osnabrug, and Paderborn, subject to the Elector of Cologne. The bishopric of Liege, subject to its own bishop. Hoyer and Diepholt, subject to the Elector of Hanover. The duchies of Minden and Cleves, subject to the King of Prussia. Westphalia proper, subject to the Elector of Cologne; Berg and Juliers, subject to the Elector Palatine. The counties of Mark and Ravensburgh, belonging to the King of Prussia; Bentheim, Steinfurt, Tecklenburg, Schawenburg, Lippe, Ritberg, Pyrmont, each subject to its respective counts.

The principal cities in this circle, are Embden, an imperial city; Munster, Paderborn, Osnabrug, Pyrmont, Lippe, Minden, Cleves, in the duchy of Berg, Dusseldorp, Juliers, and Aix-la-Chapelle, in the bishopric of Juliers, Liege, Ham, Bentheim, and Steinfurt.

4. The circle of the Lower Rhine comprehends the archbishoprics and electorates of Cologne, Mentz and Triers. The electorate of the Rhine, which includes the palatinate of

of the Rhine, Sponheim, the twelve bailiwicks of Simmeren, Creutnach, Oppenheim, &c. all subject to the Elector Palatine, except Simmeren, which is subject to its own Duke, and the bishopric of Worms a sovereign state. The chief cities in this circle, are Heidelberg, Philippsburgh, Mannheim, and Frankandel, in the palatinate on the Rhine. Cologne, Mentz, and Triers, in their respective bishoprics. Worms, on the Rhine, an imperial city; Simmeren, in the duchy of Simmeren, with some others of less note.

5. The circle of the Upper Rhine is divided into the landgraviates of Hesse Cassel, Hesse Marburg, Hesse Darmstadt, each subject to its respective landgrave. The abbey of Fuld, subject to its abbot. The abbey of Hirschfeld, subject to Hesse Cassel. The county of Waldeck, subject to its own count. The Wetteraw, which contains the counties of Solms, subject to its own count. Hanau, subject to Hesse Cassel. Eisenburg subject to its own count. Sayn, Wied, Wittgenstein, Hatzfeld, Westerberg, and Nassau, which last is divided into Dillenberg, Dietz, Hadamar, Kerberg, Seigen, Idstein, Wieselburgh, Wilsbaden, Beilstein, Otweiler, and Uffingen, each of which is subject to his own count of the house of Nassau. The county of Erpach, subject to its own count. The bishopric of Spire, a sovereign state. The duchy of Deuxponts, subject to the Duke of Deuxponts. The county of Catzenelbogen, subject to Hesse Cassel,
and

and the territory of Franckfort, a sovereign state.

The chief cities in the Upper Rhine, are Cassel, Marburg, and Darmstadt, in Hesse. Hamburg, Rhinefield, and Wanfried, likewise subject to the house of Hesse. Franckfort on the Main, an imperial city. Erpach, in the county of Erpach. Spire on the Rhine, an imperial city. Deuxponts, in the palatinate, Waldeck, Solms, Hanau, Isenberg, Solms, Sayn, Weid, &c.

6. The circle of Franconia contains the bishopricks of Wurtzburg, Bamberg, and Aichstat, subject to their several bishops. The state of the great master of the Teutonic order. The marquisates of Cullenbach, Bareith, and Anspach, subject to their respective margraves. The principality of Henneberg. The duchy of Hildburghausen, subject to its duke. The marquisate of Nuremberg, an independent state. The counties of Holach, Cassel, Schwartzenberg, Reinbuck, Warthiem, Papenheim, Sensheim, Limpurg, Dernbach, Geyer, Giech, Grevenitz, Hohenloe, Nostitz, Schoenborn, and Windischgratz.

The chief cities are Hildburghausen, Nuremberg, an imperial city, Coberg, Margen-
theim, in the state of the Grand Master of the Teutonic Order. Cassel, in Cassel. Schwartz-
zenburg, Wurtzburg, Bamberg, Aichstat,
Cullenbach, Onspach, and Henneberg.

7. The

7. The circle of Swabia comprehends the duchy of Wurtemberg, subject to the Duke of Wurtemberg Stutgard. The principality of Hoenzolleron, subject to its own prince. The marquifates of Baden-Baden, and Baden Durlach, subject to their respective margraves. The marquifate of Ortenaw. The territory of Brisgow, subject to the house of Austria. The Black Forest, containing the principality of Furstenburg, subject to its prince, and the county of Reinfelden, subject to the house of Austria. The bishopric of Constance, subject to its own bishop, under the house of Austria. The bishopric of Augsburg, subject to its own bishop. The abbeys of Kempton, Buchaw, and Lindaw. The marquifate of Burgaw, subject to the house of Austria. The counties of Oetingen, Koningseck, and Hohenrichburg. The barony of Waldburg. The barony of Limpurg. The territory of Ulm, a sovereign state. The imperial cities, or sovereign states of Nordlingen, Memminghen, Rotwel, and many others.

The chief cities of this circle are Stutgard, Tubingen and Hailbron, in the duchy of Wurtemberg. Baden Durlach, and Baden Weiler, in the marquifates of Baden. Augsburgh, an imperial city. Hockstet and Blenheim, in the bishopric of Augsburg. Ulm, an imperial city on the Danube. Constance, Koningseck, Waldburg, Limpurg, Nordlingen, Memminghen, Rotwel, Friburg, Brisac, and many more.

8. The circle of Bavaria comprehends Norgow, or the Upper Palatinate of Bavaria, which includes the Landgraviate of Lauchtenburg, the county of Chamb, and the territory of Amberg. The duchy and electorate of Bavaria, containing the territories of Munich and Ingoldstadt, all subject to the Elector of Bavaria. The bishoprics of Freisingen, Ratisbon, and Passau, subject to their own bishops. The Lower Bavaria, comprehending the territories of Straubing, Landshut, and Burkhauten, subject to the Elector of Bavaria. The archbishopric of Saltzbug, subject to its archbishop, and the duchy of Newburg, subject to the Elector Palatine.

The chief cities are Munich, Landshut, Ingoldstadt, Sultzbach, Ratisbon, an imperial city, Freisingen, Passau, Neuburg, and Saltzburgh.

9. The circle of Austria, which is all subject to the Queen of Hungary, contains the arch-duchy of Austria: this is divided into Higher and Lower Austria. Higher Austria comprehends the territories of Muhl, Schartz, Haus, and Traum. Lower Austria is divided into the territories of Upper and Lower Vienne, and Upper and Lower Manhartsberg. This circle also comprehends the duchies of Stiria, Carniola, or Crain, and Carinthia. The counties of Cilly, Goritz, and Tyrol, and the bishoprics of Brixen and Trent.

The chief cities of Austria, are Vienna, the metropolis : Gratz, in Stiria ; Cilly, Goritz, in Goritia ; Inspruck, in Tyrol, and Brixen and Trent, on the confines of Italy and Switzerland.

The kingdom of Bohemia, besides the duchy of Silesia, and the marquissate of Moravia, is properly divided into the eastern and western parts by the river Moldaw, and each of these is subdivided into nine small circles or provinces.

In the eastern part, are the provinces of Prague, Kaurfim, Becheyn, Czaflaw, Chrudim, Koniginkrays, Glatz, Boleslaw, Leitomeritz.

In the western part, are the provinces of Satz, Schlany, Rakonick, Elmbogen, Egra, Padebrock, Pilsen, Moldaw and Prachen.

The chief cities of Bohemia, are Prague, the metropolis, Carlstein in Kaurfim, Leitomeritz, Satz, Czaflaw, Pilsen, Koningratz, Elmbogen, Egra, and Glatz. The whole kingdom of Bohemia is subject to the Queen of Hungary, except Glatz, which belongs to the King of Prussia.

The duchy of Silesia is divided into Upper and Lower. In Upper Silesia are the cities of Oppelen, Neifs, Teschen, Pleis, Ratibor, Troppaw, Jagerndorf, Schweidnitz, and Jawer.

In

In Lower Silesia are the cities of Lignitz : Breslaw, the metropolis of all Silesia, Oelse, Sagan, Glogaw, and Crossen, all subject to the King of Prussia, except Tropaw and Teschen, which are subject to the house of Austria.

The marquisate of Moravia, which is subject to the house of Austria, contains the cities of Olmutz, the capital, Brin and Iglaw.

The kingdom of Hungary is likewise divided into two parts, upper and lower. Upper Hungary, which lies between the Danube and Poland, contains the following cities : Presburg, the capital of all Hungary, Newhausel, Leopoldstadt, Chrennitz, Schemnitz, Esperics, Caschaw, Egar, or Agria, Pest, Colocia, Segeden, Lippa, Great Waradin, Mongatz, Unguar, and Tokay.

Lower Hungary is situated on the south side the Danube, between that and the Drave, and contains the cities of Altenburg, Kanisha, Vesperin, or Weisborn, Raab, Gran, Alba Regalis, or Stuhl Wertheimburg, Buda, and Quinque Ecclesiæ.

In Transylvania are the cities of Harmanstadt, the capital, Saltzenberg, and Cronstadt.

In Slavonia, are the cities of Zagrab, Possega, or Poison, Gradisca, Walpon, Esseck, Walkowar, Carlowitz, and Peterwaradin.

In Croatia are the cities of Carlstadt, Sissep, and Castanowitz.

Switzerland is divided into thirteen cantons, with their allies and subjects. The cantons are those of Bern, of Fribourgh, of Basil, of Lucern, and of Soloturn, on the west; those of Schaffhausen, Zurich, and Appenzel, on the east; and those of Zug, Swiss, Glaris, Uri and Underwald, in the middle.

Every canton bears the name of its chief town, except those of Uri, the chief town of which is Altdorf, and Underwald, the chief town of which is Stanz.

The allies of the Switzers, are the Grisons, the Valesians, the republic of Geneva, the bishopric of Basil, Mulhausen, Neufchatel and Valengin, and the towns of St. Gall, Bienna, and Rotweil. Each of these countries bears the name of its chief town.

Subject to the Switzers, are the counties of Sargans, Turgow, and Rotweil, and the bailiages of Lugano, Lucarno, and Bellents; each county bearing the name of its chief town.

In the German empire are six archbishoprics, viz. Mentz, Trier, Cologn, Magdeburgh, Saltzburg, and Bremen; besides thirty-seven bishoprics.

In Bohemia is the archbishopric of Bohemia, and the bishoprics of Koningsgratz, Breslau, and Olmutz.

In Hungary, are the archbishoprics of Presburg, Gran and Colocza, besides the bishoprics of Great Waradin, Agria, Vespriin, Raab and Quinque Ecclesiæ.

In Transylvania is the bishopric of Hermanstadt. In Sclavonia, the bishoprics of Possega, and Zagrab.

In the empire, are twenty-seven universities, viz. Vienna, Mentz, Cologne, Triers, Liege, Heidelberg, Leipzig, Erfurt, Freiburg, Ingoldstadt, Tubingen, Rostock, Wittemburg, Frankfurt on the Oder, Strasburg, Gripswald, Dillinghen, Jena, Lewinghen, Helmstat, Sigen, Paderborn, Altorf, Giessen, Kiel, Gratz, and Gottingen. The university of Prague, in Prague.

The principal rivers in this country, are,

1. The Danube, which rises in Swabia, and passing eastward through Bavaria, receives the Lech, the Altmul, the Rab, Regen, Isar, and Inn: thence it passes through Austria, where it receives the Fraun, Ens, and others, runs by the walls of Vienna, receiving the river Moraw, and enters Hungary, near Presburg; then tending southward, it passes Buda and Belgrade, being exceedingly increased by the Drave,

Drave, which it receives at Esseck, and the Save at Belgrade; after which it is called Istir, and running eastward, between Walachia and Bulgaria, discharges itself with five wide mouths, into the Black, or Euxine sea: its whole course thither, from its fountain, is reckoned about 2000 miles, including its windings.

This river abounds with almost all kinds of fish, which are to be found in our running or standing rivers, which are generally much larger, but not so sweet as ours.

2. The Rhine rises in the Alps, runs north through Switzerland, and soon after dilates itself into a large lake, called the Boden Sea, or Lake of Constance, then west, to Basil, and runs north between Swabia and Alsace, into the Palatinate, receiving the Neckar at Mannheim, and the Main, at Mentz; it afterwards receives the Moselle, passes through the duchy of Cleves, and entering the Netherlands, where it divides into several branches, empties itself in the German ocean. The whole course of this noble river is about 400 miles, and including its turnings, about 600.

3. The Elbe takes its rise in Silesia, runs north west through Bohemia, Saxony, and Brandenburg, passes by Magdeburgh, Lawenburg, and Hamburg, and a little below Gluckstat, divides itself into two branches, and falls
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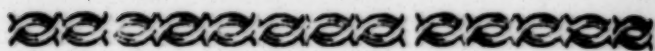
into the German ocean, 60 miles below Hamburg. Its course is about 500 miles.

4. The Oder springs in Moravia ; and after a course of 300 English miles, through Silesia and Brandenburg, falls into the Baltic sea, between Swedish and Brandenburg Pomerania.

5. The Weser rises in the mountains of Thuringen, runs through Hesse and Westphalia, and after a course of above 250 miles, empties itself into the ocean, forty miles below Bremen.

The soil of this country, especially on the banks of the Rhine and the Danube, are exceeding fruitful, where also the air is very temperate : but in the northern parts, it is colder, and the ground less fruitful. In those provinces that lie next the sea, there is plenty of rain ; in other parts, at a distance, there are considerable droughts. The north winds from the Baltic and Sweden bring frosts and snow. The eastern winds from the continent bring dry and unwholesome weather : the south, in summer, bring refreshing breezes from the Alps ; but the south-west winds are both the most frequent and wholesome that blow in Germany.

There is plenty of corn, cattle, sheep, wool, cloth, horses, fish, &c. In general, the face of the country is even, except towards the south and south-west, where the Alps serve as boundaries and bulwarks against France and Italy.



S E C T. II.

A particular Account of the most curious natural productions of Germany, Bohemia, Hungary, and Switzerland, in the Animal, Vegetable, and Fossil Kingdoms; of remarkable Mountains, and Caverns; of medicinal, and other singular Springs; of Lakes, Cataracts, and other natural Objects of Curiosity.

ANIMALS, VEGETABLES,
and FOSSILS.

IN these countries we meet with nothing remarkable in the animal or vegetable kingdoms, except the Elk be reckoned such. This animal is a native of Transylvania, and is a species of the *Cervus*, or Deer kind, distinguished by having the horns palmated, and without a stem. The generical characters of the *Cervus* are, that the horns are solid, divaricated, and deciduous; they are hairy at first, but afterwards smooth; the canine teeth of the upper jaw are single and remote.

The Elk is a very large and strong animal; it is equal to a well-sized horse in magnitude, and not inferior in strength; but is a much less beautiful creature; the head is large and oblong, very broad at the forehead, and tapering

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The Elk

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pering to the nose, where it is small but obtuse; but the mouth is large, the lips thick, and the teeth strong; the eyes are moderately large, but they do not stand prominent; the ears are remarkably large and long; they, in this respect, resemble those of the ass; and indeed, the female Elk is not greatly unlike that creature in her general figure; the ears are nine inches in length, and four in breadth, and are erect and patulous; the horns are not tall and ramose, in the manner of those of the deer kind, but they arise with a thick and short trunk, which almost immediately spreads into a vast breadth; and this expansion, which resembles, in some degree, an open hand, is ornamented at the extremity with denticulations, resembling fingers; the neck is short and thick, the body is large, and the back broad and flatted; the legs are extremely robust; the horns in the male, for the female has none, refer the creature at sight to the stag class: but the bulk of the body, and the general proportions, if the female alone were examined, would not lead any one to think it such. The body is covered with a thick deep fur, the hairs are rigid, and very firm; the colour of the whole creature is a dusky brownish grey, only the belly is somewhat paler, and the legs darker than the rest: the hoofs are divided exactly in the manner of those of the stag, and are supposed to have a great virtue in nervous disorders. It is a native of several other parts in the north of Europe,

bears

bears the frozen countries very well, and runs upon the ice in a strange manner.

Germany and the other countries included in this *Chapter* abound with metals and minerals of various kinds, and contain some remarkable mines; among which may be reckoned the salt-mines near Eperies, in Upper Hungary, which are 180 fathoms deep, and the salt runs in such large veins, that they sometimes dig pieces not less than ten thousand weight; but these are usually cut into square pieces, two feet long, and one foot thick, for the convenience of drawing them out of the mine. The colour of the ordinary stone is somewhat grey, but when it is broke, and ground for use, it becomes as white as if it was refined. Some of the salt is of a delicate blue, some yellow, and some as hard and transparent as crystal, which is wrought into various little toys and utensils. The water of this mine, when boiled, yields a blackish salt, which they give to their cattle.

A curious naturalist cannot help admiring in those pits, the flowers of salt, which grow like the beard of a goat, but much whiter and finer; but they are not to be found in all the cuts, nor at all times, only appearing according to the temperature of the season. These plumes of salt are very brittle, will melt in moist places, and dissolve into a volatile oil; but they are the purest, whitest, most acid
and

and beautiful salt that can be imagined. Another thing remarkable in this mine is a chapel, big enough to contain a hundred people, with an altar, pulpit, sacristy, and seats, all cut out of a rock of salt. In this chapel divine service is celebrated once a year, a Jesuit of Eperies always preaching the sermon.

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Near Hallein, in the archbishopric of Saltzbourg, in Germany, there is a high mountain, the earth of which is mixed with a sort of alum or salt-petre, which being laid for three or four weeks in large trenches filled with fresh water, the earthy part subsides, and the water is then drawn off and boiled in huge iron pans, till it is quite evaporated, and leaves the salt at the bottom. This mountain is pierced in a thousand places, so that very good guides are necessary to conduct strangers who have the curiosity to visit this subterraneous labyrinth, which is seldom done without a great deal of ceremony. Before they enter these works, they generally repair to a church upon the mountain to perform their devotions, after which they breakfast at a public house near the church, and being furnished with proper dresses and other necessities, every one takes a lighted candle or torch in his hand, and some of the guides go before and others behind the spectators, lest they should be frightened or lose their way in these dismal caverns.

Hungary

Hungary is famous for its gold and silver mines; the richest gold mine is that of Chremnitz, which is about 160 fathoms deep, is several English miles in length, and has been wrought above 900 years. The veins generally run north or east, and the miners direct themselves under ground by a compass. Some of the passages in this mine, cut long ago through the rocks, by being disused are quite closed up again, and others are become very narrow, the rocks growing and uniting by degrees, especially in moist places. Pieces of pure gold, of a considerable size, have been sometimes found in this mine; but the gold is generally bedded in a sort of stony glebe or ore of several colours, some white, some black, red, or yellow, some white with black spots in it, which is esteemed the best: nay, the common yellow earth of the country about Chremnitz affords some gold, and has been washed and wrought with considerable profit.

They have various methods of separating the gold from the ore, but the most usual one is this. After the ore is broke and pounded very small, they lay it upon fine cloths, washing and stirring it about till the earthy and lighter parts are washed away, and the heavier metal-line parts are left behind. These cloths are afterwards washed clean in several tubs, and the water, when settled, is poured off from its sediment; which sediment is again washed and stirred about, till at length they add quicksilver to it, kneading it well together, and then

then washing it again in a wooden vessel. The gold and quicksilver being thus mixed together, they strain off as much of the quicksilver as they can, first through coarse and then through fine cloths, and the remaining mass is laid upon a perforated plate, set over a deep pan fixed in the ground, in the bottom of which they also put some quicksilver. This pan is covered over, and the cover well luted; and a charcoal fire being made upon it, the quicksilver yet remaining in the gold is driven down to that in the bottom of the pan. The gold is then taken out and thrown into the fire, when it undergoes a farther purification.

Of the silver mines in Hungary, those at Schemnitz are the most considerable. They are six in number, one of which, called Trinity Mine, is seventy fathoms deep, and being of an earthy soil, its ore is much esteemed. In another of these mines is a large wheel, twelve yards in diameter, which is turned by the fall of subterraneous waters, and works engines that raise the water from the bottom of the mines up to the place where the wheel is fixed; which water, together with that which turns the wheel, runs out at the foot of a hill through an opening cut for that purpose. The ore that is of a blackish colour is reckoned the best, and much of it is mixed with a shining yellow substance, which, if not in too great quantity, renders the ore more easily fusible: but as the ore found in these mines differs in its mixtures, so also does it in its richness, some
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of it yielding half silver, though this is very rare, some of it twenty ounces, and some of it not above an ounce in a hundred weight. To separate the silver, the ore is melted in a furnace, from whence the metal runs into a pan placed in the earth before it, and there acquires a hard scum or dross, which they take off, and add lead to the remaining silver. This being again melted in another furnace, the lead, and what other mixture may yet remain in the silver, swims on the top like oil, is blown off by bellows, and becomes litharge, which is of a paler or deeper colour according to the time it continues in the fire, or the degree of heat it undergoes *.

In the neighbourhood of Fridberg in Saxony, there are mines of several sorts of metal, and particularly some of silver, which yield such quantities that the Elector's profit arising

* Litharge is distinguished into two kinds, viz. Litharge of gold, and litharge of silver, according as it resembles those metals in colour: not that the one is made from silver, and the other from gold; but the difference arises only from its having been more or less exposed to the fire, or containing a greater or less mixture of copper. It is of a drying, detergent, and gently-astringent quality, and is frequently used in external applications, making the basis of several plasters. Potters use litharges to give a beautiful gloss to their ware; and they are also used by painters, dyers, skimmers, and glaziers. When mixed with wine they give it a bright colour, but render it very unwholesome.

from

from them is said to amount to 130,000 l. per annum. The chief of these mines is above 200 fathoms deep, and was formerly so rich, that an hundred weight of ore produced sixty pounds of silver, but commonly a pound of ore yields an ounce and a half or thereabouts. It is computed, that since the first opening of this mine, about the end of the twelfth century, it has yielded above a hundred millions of silver. These mines are subject to damps, which sometimes kill the workmen; and the dust, which settles on their lungs, frequently throws them into consumptions; but they wear vizards with glass eyes, to prevent as much as possible its annoying them.

It is said that in Saxony, as well as in some other places, they discover the veins of ore, and know where to sink a mine, by virtue of a sort of wand called *Virgula divina* *.

Besides

* The *Virgula divina*, or *Baculus divinatorius*, is nothing but a forked branch of a hazle tree, by means whereof some people pretend to discover mines, springs, &c. under ground. The person carries it in his hand, walking over the places where he suspects the ore or springs to lie, and it is said that the effluvia exhaling from the metals, or vapour from the water, will cause the stick to incline or point to the ground, which is reckoned an infallible sign of a discovery. We find no mention of this *Virgula* in any author before the eleventh century, but since that time it has been in frequent use, and has obtained several fine names, some

Besides these precious metals, the mines of Germany and Hungary afford many other curious and useful fossils. In those of Saxony just mentioned, there is found a kind of sulphur ore or pyrites, which being broken into small pieces, and thrown into earthen vessels placed in proper furnaces, the sulphur contained in the ore is melted by the fire, and runs out through a narrow hole into leaden vessels filled with water, where it concretes immediately, and the substance which remains behind, contains a considerable quantity of vitriol. The sulphur is purified by melting it a second time in iron vessels, and boiling it with the addition of some linseed oil; after which it is either made up in large lumps, or poured into cylindrical moulds, and so formed into rolls. Thus prepared it is called brimstone; and vast quantities of this kind of sulphur are yearly made in Saxony, and transported into all parts of Europe.

Sulphur vivum, or native sulphur, is likewise found in the mines of Germany, Switzerland, and Hungary, sometimes in transparent pieces of a beautiful yellow colour; but the coarse, opaque, greyish kind is most common,

calling it *Caduceus*, others Aaron's Rod, &c. This artifice made a great noise in France, towards the end of the last century, and its advocates endeavoured to account for it on the principles of the corpuscular philosophy; but it is now in little credit.

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being usually found in flat masses of various sizes, and sometimes in whole strata of a considerable thickness. Sulphur is also found in the form of a fine yellow powder, adhering to the stones and wood about the baths of Aix-la-Chapelle in Westphalia, those of Euda in Hungary, and other sulphureous springs; in which state it very much resembles the common flower of brimstone *.

Native vitriol is a kind of fossil salt not uncommon in the German and Hungarian mines; and particularly in those of Goslar in Saxony there is a fine green vitriol, very bright and transparent, found in the clefts of the rocks in great abundance. In these mines there is also a white vitriol, sometimes found in pieces of a compact substance, but most commonly in form of a downy efflorescence on the tops and sides of the caverns, which being dissolved in water, is afterwards boiled till it concretes into a white mass like sugar, and is then formed into those large cakes in which we receive it from

* Sulphur in this form, and indeed in most others, is of excellent service in diseases of the lungs, of which it is, by way of eminence, called the Balsam; because it promotes expectoration, and clears and strengthens that organ. It is therefore very beneficial in a phthisis, asthma, or catarrh; and it has ever been a famous medicine in cutaneous diseases, whether used inwardly or outwardly. Externally applied it discusses hard tumors; and taken inwardly it is laxative, and promotes insensible perspiration.

abroad. There is another vitriol of a bluish green which is sometimes found in the mines of Saxony, but more frequently in those of Hungary and Transylvania; and Dr. Brown mentions a red vitriol in the gold mines of Chremnitz, which perhaps is the chalcitis of the antients. These vitriols owe their origin to iron or copper, dissolved by the acid of sulphur and water, and again concreted into the forms wherein they are found. The green colour is derived from iron, the blue from copper, and the white and red proceed from a mixture of some other substances.

As to factitious vitriols, they are obtained by various methods from vitriolic waters, earths, and stones, and especially from the pyrites. At Fridberg in Saxony, they burn the stony ore from which the sulphur has been separated, as mentioned above, and putting it into a large vessel, they pour water upon it, which imbibes the vitriol it contains, and being afterwards boiled to a certain consistence, is let out into coolers, where the purest part of the vitriol adheres to sticks placed there on purpose, and the rest to the sides and bottom.

In the neighbourhood of the copper-mines in Hungary, and sometimes in the mines themselves, there are found small streams of clear vitriolic water *, in which, if a piece of iron
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* In the *Philosophical Transactions*, No. 384, we have an account of the body of a man found under

be put, and immediately taken out again, it is found covered with a thin crust of copper; and if the iron remain long in the water, it is gradually dissolved, and the copper precipitated and left in its place. This water being boiled to a proper consistence, and set to crytallize, yields a beautiful blue vitriol, shooting into regular figures, consisting of ten sides, in which form we find it in the shops. These crytals, if wetted and rubbed on the blade of a knife, give it the colour of copper, that metal being the basis of this vitriol *.

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under water in a copper-mine, eighty-two fathoms deep, where he had been killed by the falling in of a rock, which had crushed both his legs and his right arm, but his face, his body, and his cloaths were all preserved entire and free from putrefaction by means of the vitriol with which the water was impregnated. He was taken up in the year 1719, and was well known by an old miner, who remembered his going down by himself into the mine in 1670, after which the inan was missing, and supposed to be smothered in the ruins. This account was confirmed by several others, and particularly by an old woman, to whom he had been contracted. He had therefore lain under ground forty-nine years; and not only his cloaths and linen, but his flesh and skin, which were almost as hard as horn, had been preserved from corruption by the vitriolic water,

* The uses of vitriol are very great, both in medicine and mechanics. The white sort is frequently used in collyriums, to allay an inflammation of the eyes, and stop their running; and,

We should far exceed our limits, if we should attempt a description of all the fossils to be found in the mines of Germany, Hungary, and Transylvania, such as antimony, bismuth, orpiment, and a great variety of others. Hungary has mines of quicksilver, which afford great quantities; but those in the county of Gorizia, a part of the province of Friuli, belonging to the house of Austria, are perhaps the richest of the kind in Europe, the ore generally containing half, and sometimes two thirds of quicksilver. These mines are at Idria, and the entrance into them is in the town itself, from whence to the deepest part is above 120 fathoms. The quicksilver is sometimes found in its native state, lodged in the cavities of the stones, and gushing out in a stream when the miners break them, and this is called virgin quicksilver; but it is more usually found in the form of ore, which is pounded and washed, and distilled in large iron retorts, from whence the mercury comes over pure into the receiver. Eight hundred retorts are employed at a time in the furnaces belonging to the mines of Idria; and we may judge of the vast quantities

when properly purified, it is a gentle and safe emetic. The powder of the bluish-green is an excellent styptic, as the miners know by experience, who always apply it to their wounds to stop the bleeding. Vitriol is much used by dyers and hatters, especially the factitious green, which we call copperas; and this is also a principal ingredient in writing-ink, though the white is greatly preferable for that purpose.

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of quicksilver procured from these mines, by what Dr. Brown tells us, viz. that when he was there, he saw in the castle above 470 tons of it in barrels; and in another place as much ore as would take up two years to distil *.

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* Quicksilver, which was reckoned poisonous by the ancients, is now found to be a most excellent medicine when judiciously administered, and has been of late years used with great success in many distempers, which before were esteemed extremely obstinate, if not incurable. It opens the pores, small vessels, and ducts of the glands, attenuates viscid humours, and dissipates concretions, even in the remotest parts of the body. Whether taken inwardly, or applied outwardly by unction, it discharges the humours by stool, sweat, and insensible perspiration; but its usual method of operating is by the evacuation of a mucous saliva, whence it is called a salivation. This is thought the most effectual remedy yet discovered for the venereal disease; though several eminent physicians condemn the practice of salivating as contributing nothing to the cure, the full effect of the medicine being to be had without putting the patient to that unnecessary torture.

Quicksilver is of considerable use in gilding, making looking-glasses, refining gold, &c. but its effluvia are very pernicious, as the workmen employed about it know by experience: and it is observed, that the miners, though of the strongest constitutions imaginable, seldom remain four years in a healthy state, but are seized with tremblings and palfies, and die in a miserable manner. Indeed the subtilty and penetrating nature of this mineral

The mines of Bohemia and Silesia yield considerable quantities of gold and silver, as well as of the baser metals; and those of Bohemia and Silesia abound more with agates, garnets, sapphires, amethysts, and other precious stones, than any part of Germany, or indeed of Europe. Of the agate and garnet some notice has been taken already*; the other gems here mentioned require a brief description.

The sapphire, which some call the gem of gems, is a very beautiful stone, of a deep sky-blue, approaching nearest to the diamond in lustre, transparency, and hardness. This is the finest and most valuable kind of sapphire; but those of Bohemia and Silesia are somewhat softer and of a paler blue, and are improperly called by our jewellers water-sapphires. Some of these gems have no colour at all, being pellucid as the clearest water, and resembling

mineral is very surprising; for Dr. Pope tells us, that he saw a workman in the mines of Friuli, who in half a year's time was so impregnated with the mercury, that putting a piece of brass in his mouth, or rubbing it between his fingers, it would turn white as silver. We may add, that by an injudicious use of quicksilver, whether outwardly or inwardly, the nerves are weakened, corrupted, and contracted; whence tremors, palsies, and too great an attenuation of the fluids, which often brings on a fatal salivation, ulcers in the mouth and throat, and incurable loosenesses.

* See Vol. VI. p. 35.

a diamond ; and others have a white milky cast, with a slight tinge of blue amongst it. They are found of various forms and sizes, sometimes three quarters of an inch, but seldom above one sixth of an inch in diameter. A sapphire of the deepest blue may be perfectly deprived of its colour by fire, so as to resemble those which are naturally colourless, and even pass for a diamond.

The sapphires brought from the East Indies are called oriental, and those found in Europe are termed occidental ; which latter, though often very beautiful, are inferior to the former both in lustre and hardness.

The amethyst is a gem of a beautiful colour, being a mixture of blue and red, which, as either of these tinges prevail, form different degrees of purple. Sometimes it is found quite colourless ; and whether naturally so, or divested of its colour by means of fire, it is scarce to be distinguished from a diamond, except by its degrees of hardness. This gem is found of various sizes, from that of a small vetch, to an inch and a half in diameter ; and its forms are likewise different, being sometimes roundish, sometimes shaped like a pear, but most commonly hexangular and pointed like crystals.

The oriental amethysts are generally reckoned the best, but some of those found in Silesia and Bohemia, as well as in other parts
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of Europe *, are little inferior to those brought from the Indies, either in hardness or beauty.

Besides the native fossils we have here mentioned, and many more that might be added, Germany abounds with those of the extraneous kind, which are bodies of the animal or vegetable kingdoms accidentally buried in the earth, such as trees, leaves, herbs, shells, teeth and bones of fishes, or land-animals, &c. which are found more or less altered from their original state, according to the time they have lain, and the matter wherein they have been immersed. Of these extraneous or adventitious fossils some general account has been given in treating of the fossils of the British islands, which afford a considerable variety of them. Whole trees, or considerable parts of them, are most frequently found in bogs or peat-earth, and sometimes scarce altered at all, except in colour, the oaks in particular being commonly turned to a jetty black. Branches

* Amethysts are not uncommon in Italy; the the Pyrenean mountains, and those of Auvergne in France, afford very good ones; and some of the finest sort are dug out of a mountain near Vic in Catalonia, where they are lodged amongst a reddish earth in the perpendicular fissures of the rock.

Some have pretended that the amethyst worn on the finger, or drank in powder, prevents drunkenness, which they suppose is implied in the name; but this virtue, like many more ascribed to gems and other stones, is only imaginary.

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of trees are also found bedded in strata of clay or stone, and fragments of wood, chiefly of oak, are sometimes met with among gravel, and in several other strata; and many of these being filled with crystalline or stony particles, but still retaining the veins of wood, make a beautiful figure when they are polished. Instances of wood perfectly petrified or changed into stone, at least to appearance, are not uncommon; though many substances have been mistaken for petrified wood, and preserved as such in the cabinets of the curious.

As to the smaller plants and leaves of trees, they are most commonly found immersed in a black slaty stone over the strata of coal, but in Germany they are frequently contained in a whitish stone somewhat harder than chalk, as well as in slaty stones of different colours. These plants are principally of the fern-kind, and what is very surprising, many of them seem not to be of European growth, but peculiar to America, and others are of species to us unknown. The leaves of trees most frequently found in Germany are those of the willow, white thorn, and poplar; also the small branches of box and thyme, ears of barley, and mosses of various kinds, are there met with in great perfection.

We shall say nothing of the several species of corals buried in the earth, because some will not allow them to be extraneous fossils, but to have belonged originally to the mineral king-

kingdom. Of animal substances, particularly shells, teeth, bones, &c. we find an almost infinite variety, and sometimes compleat fishes, either closely bedded in stone, or in strata of a looser nature; and amongst these bodies it is not uncommon to find in this part of the world the shells of fishes belonging only to distant seas, as well as several unknown species. As to land-animals, we have perhaps no instances of their being found entire in the earth; but parts of them are very common, and that in such places and quantities as make it really amazing to consider. The tusks and grinders of elephants, the horns of deer, the teeth of horses and other quadrupeds, and the larger bones of divers kinds of animals, are often found loose in the earth, and sometimes immersed in the hardest stone. Some of these, by the coppery particles they have lain amongst, become spotted and veined with blue, which colour being diffused through them by putting them in a gentle fire, they very much resemble the native turquoises, so as to deceive the jewellers themselves: and what we call the unicorn-stone, the *unicornu fossile* of the shops, is nothing but such a bony substance impregnated with a kind of earthy spar, found commonly enough in the caverns of Germany. The parts of fishes are much more frequent in the fossil world, than the whole bodies of them; and yet Germany and other countries afford us many instances of entire fishes found immersed in stone, flatted indeed, but perfect in their forms, and easily distinguished as to their

their several species. The glossopetræ, vulgarly supposed to have been the tongues of serpents petrified, from whence their name, are found in vast numbers in Germany *, and are now well known to be the teeth of sharks or other fishes; and several mistakes, with respect to the origin of fossil bodies, may probably be yet discovered by more accurate enquiries. As to fossil shells, which are much the most numerous class of animal substances buried in the earth, they are found in most parts of the world, and many of them are extremely beautiful.

On the coasts of Brandenburg Pomerania, as well as on those of Prussia, is found a very hard inflammable substance called amber, and by naturalists *succinum*, and *electrum*, of one uniform structure, of a bituminous taste, a very fragrant smell when rubbed, and highly endowed with the property from it called electricity. Amber is thrown up by the sea in those

* The glossopetræ are common enough in many parts of the world, but nowhere so frequent as in the island of Malta. They are supposed good against poisons, and particularly the bites of serpents; which virtue seems to be superstitiously ascribed to them from the viper's fastening upon St. Paul's hand without doing him any harm; and ever since, say they, no venomous creature will live upon the island. But the origin of these fossils is now so well known, as to destroy the foundation of that vulgar notion.

parts, and is not only found among the seaweeds and sand, but also dug out of the rocks and mines. It is a hard, dry, transparent, toughish, though brittle substance, of a styptic taste, and, when warm, of a peculiar fragrant tartish smell. It makes no effervescence with acids; and when rubbed so as to heat, it will attract straws, bits of paper, or any other light substance, and even metals in thin pieces, as leaf-brass and the like. It is one of the lightest fossils we know, is soluble in spirit of wine, in the essential oils of plants, and likewise, though with much difficulty, in some of the expressed oils, as that of linseed. On a chemical analysis, it yields at first a subacid water, and afterwards a yellow fetid oil, and a volatile salt; the remainder in the retort being a black, light, and friable matter, resembling in colour the *bitumen judaicum*.

Natural historians have been greatly in the dark about the origin of amber. Some have maintained it an animal substance; others have taken it for a resinous juice, oozing from poplars and firs; and the generality of authors contend for its being a bitumen, which trickling into the sea from some subterranean sources, and there mixing with the vitriolic salts, which abound in those parts, becomes congealed and fixed, the result of which congelation is amber. However, as good amber is found in digging at a great distance from the sea, it is most probable that it is wholly of mineral origin, and

is a bitumen, once liquid, of the naphtha or petroleum kind *, hardened into its present state by a mineral acid, of the nature of spirit of sulphur, or oil of vitriol; more especially as these substances abound in the earth, and an artificial mixture of them produce a body very much like native amber, and affording all its principles on a chemical analysis. The natural colour of amber is a fine pale yellow, but it is often made white, sometimes black, and in both cases is rendered opaque by the admixture of extraneous bodies. Sometimes it is tinged with metalline particles, and remains pellucid; but the most frequent variation from the yellow, is into a dusky brown. Amber is used in medicine; and, being reduced to powder, is given in the fluor albus, convulsions, and in all disorders of the nerves. The preparations of it in use are, 1. Salt of amber. 2. The oil of amber. 3. Tincture of amber. The salt and oil of amber are obtained by the same process: the salt is a true acid, and the only one that is obtained in a solid saline form; the oils greatly resemble the native petrolea or naphthæ, the substances from which amber was formed. The salt is diaphoretic, and diuretic; is esteemed in convulsions, headaches, and all nervous and hysteric complaints. The oil, by rectification, becomes a good anti-hysteric and emmenagogue, being very subtile and penetrating: externally, it is of use in

* See Vol. VI. p. 194. & seq.

restoring contracted paralytic limbs. Tincture of amber is procured by digestion in spirit of wine, with a sand-heat ; and has all the virtues of amber in the substance. The mechanical uses of amber are seen in toys, cabinets, utensils, and the better sort of varnishing.



MOUN.

MOUNTAINS *and* CAVERNS.

THE principal mountains of these countries are the Alps, which divide Germany from Italy, on which Switzerland lies, and by a particular chain of which, almost every canton of that country is separated from another. The Alps have been already taken notice of in the last chapter, among the mountains of Italy, and some of their peculiarities described; but as nothing has been said in particular of their height, and as the mountains of Switzerland are generally allowed to be not only the highest part of the Alps, but the highest mountains in Europe, it is thought proper to say something upon that subject in this place.

The Joch, a high mountain in the territory of Engelberg, where it borders upon the canton of Bern, has been found, by the falling of the mercury in the barometer*, according to Dr. Scheuchzer's calculation, to be five thousand nine hundred and twenty-six feet above the

* The barometer is a machine for measuring the weight of the atmosphere, and to shew the variations therein, in order chiefly to determine the changes of weather. This machine is founded on the Torricellian experiment, as it is called from its inventor Torricelli, which is a glass tube filled

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with

the level of the sea : and yet this is far from being the highest mountain in that neighbourhood, for next to it rises another called Titlisberg, covered with perpetual snow, which is at least a thousand feet higher than the Joch, and indeed one of the highest in the country.

The Gemmi is a very lofty mountain, over which there is a passage, but only in the summer, from the canton of Bern to Leuck in Valesia. The descent on the south side of this mountain is steep and frightful beyond description, being a narrow path cut on the side of almost perpendicular precipices, and sometimes we cross over the clefts in the rocks on planks,

with mercury, hermetically sealed at one end, and having the open end immersed in a vessel of stagnant mercury. Now the mercury in the tube being sustained by the pressure of the atmosphere on the surface of the stagnant mercury, it follows, that as the weight of the atmosphere diminishes, the mercury in the tube will descend ; and on the contrary, as it increases, the mercury will again ascend ; the column of mercury suspended in the tube being always equal to the weight of the incumbent atmosphere. Hence we have a curious method of measuring the height of mountains, the atmosphere growing lighter, and consequently the mercury sinking in the tube, in proportion to the height ascended. From these principles, supported by observations and experiments, several learned men have attempted to derive proper tables,

planks, or quivering wooden bridges. The height of this mountain, at a cottage called Zur Dauben, a resting place for weary travellers, appears by the barometer to be six thousand and twelve feet, being the highest part of it that is passable.

As to the Avicula, the St. Gothard, the Furca, the Grimfula, the Crispalt, and a long chain of other mountains, which begin in the upper Valois, traverse the canton of Uri, and so run across the country of the Grisons, towards Tyrol, their greatest height above the level of the sea may be fixed, in round numbers, at seven thousand five hundred, or eight thousand feet.

But

bles, by which the altitude of any place may be determined, if the height of the mercury be given, or the height of the mercury from the given altitude of the place; and the expansions of the air likewise settled, as they answer to every inch or part of an inch in the barometer. Mr. Derham, observing very nicely the variation of the mercury from the bottom to the top of the Monument, in London, found that at the height of eighty-two feet, it fell one tenth of an inch, and two tenths at one hundred and sixty-four feet; and repeating the same experiment, his observations agreed exactly with the first trial. At the top of Snowdon hill in Wales, which is one thousand two hundred and forty yards high, Dr. Halley found the mercury three inches eight tenths lower than at the bottom of the mountain.

But the highest of all the mountains of Switzerland, according to Scheuchzer, is the Stella, or Piz Stail, in the country of the Grisons, the perpendicular height of which, according to the Doctor's observations, is nine thousand five hundred and eighty-five feet; or twelve thousand one hundred and ninety six, according to Cassini, a height which the Chamois themselves scarce venture to ascend.

On the other hand, Mr. Martel thinks the White Mountain, which is seen from the banks of the lake of Geneva, at fourteen or fifteen leagues distance, to the south east, to be the loftiest mountain of all the Alps; and to be twelve thousand four hundred and fifty nine feet above the level of the Rhone at Geneva. M. de la Condamine thinks this by much the highest mountain of the Alps; the upper half of it is always covered with snow; and M. Fatio de Duillier, who measured its height geometrically, makes it at least two thousand toises, or twelve thousand Paris feet above the surface of the lake, and the lake four hundred and twenty-six toises, or two thousand five hundred and fifty-six feet, above the level of the sea, according to a calculation founded on the declivity of the Rhone, from its discharge out of the lake; and thus the height of the White Mountain is, according to M. Fatio, two thousand four hundred and twenty-six toises, or fourteen thousand five hundred and fifty-six Paris feet, above the sea, which M.

de

de la Condamine observes, amounts within a very little to the height of the craggy summit of the Volcano of Pitchincha, near the city of Quito in Peru, in South America, where the same gentleman observed the mercury descend in the barometer to sixteen inches.

But M. de Chezeaux, who measured a much larger base than M. Fatio, and who ought therefore to have attained a precision as much greater in the heights which he had deduced from thence, increases still the altitude of the White Mountain two hundred and fifty toises, or fifteen hundred Paris feet; that is to say, upwards of five hundred toises, or three thousand feet higher than the Pike of Teneriffe, which passed for the highest mountain of Europe. The White Mountain is also seen from the environs of Langres, at sixty leagues distance, from whence they distinguish its summit covered with snow above the chain of mount Jura.

Mount Cenis is another of the Alps, which passes for one of the highest mountains in Europe.

The mountain of St. Gothard in the canton of Uri is a very important pass to Italy, and is thus described by Dr. Scheuchzer. The road over it is partly pleasant, and partly rugged and dangerous. In the lower parts of the mountain, are beautiful forests of trees,
rising

rising one above another, through which there is just a glimmering prospect of the foaming Rufs, roaring along with an impetuous course, after being joined by rivers that fall from the mountains. Of these some descend with a gentle murmur, and others rattle down the precipices with a frightful noise, while many of them, by reason of the rocks that obstruct their passage, are resolved into mist, which, by the refracting rays of the sun, form a variety of wonderful rainbows. As the traveller advances, he is terrified at the view of frightful rocks, hanging over the road, and so worn out underneath, as if they were just going to fall, and crush him to atoms.

About half way down the mountain of St. Gothard is a hollow, over which nature has formed a sort of bridge of snow and ice, perfectly hardened, under which the Tessin runs with a great noise; and the bridge, trembling under the feet of passengers, has obtained the name of the trembling valley.

In the canton of Glaris, is a lake, called Wahlestatt, which is surrounded with mountains, whereof one that separates this canton from the country of the Grisons, has a hole pierced through it near the top, called St. Martin's hole. Through this hole the sky may be seen on a certain part of the lake; and it is the only inlet of the sun beams, upon a small village called Elm, for four weeks, together, about the time of the equinox, every
Spring

Spring and Autumn, when the sun transmits his rays upon this village through St. Martin's hole, as through a natural telescope. In the canton of Bern, there is another mountain, called the Eyger, pierced in like manner, with a large hole near the top, through which the rays of the sun pass for two or three weeks in February and October.

Mount Broeken in Brunswick, is reckoned one of the highest mountains in Germany. Between Blankenburg and Elbingrode, not far from Broeken, is a remarkable cavern, called Buman's hole, from one Buman who discovered it. The entrance of this cave is very narrow, but the extremity of it has never yet been discovered, though some of the miners in the neighbourhood have affirmed, that they have travelled upwards of twenty miles through it. Large bones of strange animals have been found in this cavern, among which was a gigantic skeleton.

There are two great rocks near the convent of Michaelstein, in the same duchy, which represent two monks in their proper habits, as neat as if they had been carved out, and are therefore called the Monks craigs. Many castles are found in these countries, on the tops of inaccessible rocks, and some actually hewn out of the rocks.

MEDICINAL SPRINGS, *and other*
SINGULAR SPRINGS, LAKES,
and CATARACTS.

Germany, Hungary and Switzerland, are famous for mineral waters of various qualities: but of all the medicinal springs in these countries, none appears to have obtained a greater reputation than the springs of Spa, or Spaw, in the bishopric of Liege in Germany, which are not only resorted to by people from most parts of Europe; but great quantities of the water sealed up in bottles are sent into other countries, particularly into Great Britain and Holland. In the town of Spaw and its neighbourhood, there are five springs, which are more frequented than the rest, but the waters of the Pouhon spring, in the market-place, are most esteemed, being preferred by the best physicians to all the mineral waters in or near the bishopric. They promote digestion, remove obstructions, strengthen the tone of the viscera, and are efficacious in several chronical diseases. The Capuchins have a fine monastery at Spaw, and large gardens, where the company walk that drink the waters, the season for which, are the months of June, July and August.

The celebrated springs of Pyrmont in Westphalia, are much of the same nature with those of Spaw, and are even preferable
in

in many cases ; but neither these nor any other mineral waters should be indiscreetly used without consulting a physician. At the proper season there is a great resort of the nobility of Germany, as well as others, to drink the Pyrmont waters, which are also exported abroad in large quantities from Bremen, to which place they are carried by the river Weser.*

As the waters of Spaw and Pyrmont are in greatest repute for drinking, so those of Aix la Chapelle, in Westphalia, are perhaps the most noted for bathing of any in Germany, being much frequented by the English and other nations. The principal baths in the Old Town, are the Emperor's bath, the Little bath, and that of St. Quirinus, in the first of which the Emperor Charlemagne used to bathe with his sons and nobles, being then all in one, whereas it is now divided into several apartments. The springs that fill these baths rise so hot, that they let them cool ten or twelve hours before they are used. They are impregnated with nitre and sulphur, are at first unpleasant to the taste, and of a disagreeable smell. Those in the New Town, which are the Rose bath, the Poor's bath, and St. Corneille's bath,

* It appears from the Philosophical Transactions, N°. 448, that in calm dry weather and a clear sky, there arises from the Pyrmont springs, a sulphureous steam, which suffocates birds that approach it.

are not so hot and clear as the former, but with respect to their smell and taste there is not much difference. Near the hot springs lie several cold ones, and there is one moderately warm, much resorted to in summer mornings, and drank for chronical diseases.

Bathing in the waters of Aix la Chapelle, is reckoned good against convulsions, palsies, numbness, tremblings, gout, sciatica, the diseases peculiar to women, nephritic disorders, and for carrying off the dregs of bad mercury made use of in venereal cases. Though these waters are properest for bathing, they are also drank in several distempers with success, particularly in obstructions of the liver, spleen, and reins, and in the scurvy, jaundice, and dropsy. They are excellent against stubborn fevers, agues, inveterate cholics, asthmas, and cutaneous diseases; they purge the urinary vessels, discharge gravel, relieve melancholy, and are serviceable in various other cases.

In a village near the town are many other hot baths, the water of which is clear and pleasant, without any disagreeable smell; and here people of all ages and conditions bathe freely, not only for health, but for diversion. The springs of this village and those of the city are so plentiful, that it is computed they yield every day six thousand tuns of water. The first season for these baths begins in May, the second in August.

The

The town of Baden in Switzerland, has been long famous for its hot baths, and to them it chiefly owes its flourishing condition. They are about half a mile from the town, and are supplied from seven springs by the side of the river Limmat, whose waters contain a great deal of sulphur, with a mixture of alum and nitre. They are used for drinking as well as bathing, and are recommended for the cure of fevers, althmas, pains in the head, disorders in the breast and bowels, and particularly for the diseases to which women are subject.

The hot baths of Baden in Swabia, whose waters proceed from rocks of salt, alum, and brimstone, are reckoned an infallible remedy for the cramp, gout, and other nervous distempers, on which account they are much frequented. Some of them are very hot, particularly one called the Kettle, the water whereof boils and smoaks as if it were over a furnace.

There is another town of the same name in Austria, whose hot waters are resorted to several months in the year for bathing; and the German physicians recommend them, if drank in time, for the gout, dropsy, and other chronical diseases.

The baths of Buda in Hungary, are reckoned the finest in Europe for plentiful springs and

magnificent buildings. Some of the waters are fit either for bathing or drinking, but several are so hot that they cannot be used without conveying them to cool into other baths, or mixing them with cold water. They have a sulphureous smell, and are of a petrifying quality. Here is a cold bath so near to a hot one, that a man may put his hand from one into the other.

It is said here are fish in some basons or ponds of hot water, which being thrown into the neighbouring Danube, or other cold water, die immediately.

There are a great many other springs in these countries, which are remarkable for their medicinal virtues, but of which the brevity necessary to be observed on this article will admit of no particular mention.

In the Philosophical Transactions we have an account of a strange spring near Paderborn in Westphalia, which loses itself twice in twenty-four hours, but returns with a great noise, and with such force, that the stream turns three mills a little below; for which reason, it is called the *Bolder Born*, or *Boisterous Spring*. There is also an account of another remarkable spring, near the same city, which sends forth three streams at a little distance from each other; one of which is limpid, bluish, lukewarm, and impregnated with vitriol,

vitriol, alum, sulphur, and other minerals; the second with much the same taste, but turbid, whitish, and cold as ice; and the third tasting both sour and sweet, but very clear, and of a greenish colour.

The Danube has several considerable cataracts, the most remarkable of which are the Saw Ruffel, or Swine's Snout, near Lintz, so called from a prominent rock, which has under it a dangerous whirlpool; and another called Der Strudel, where the falling of the water makes a dreadful noise.

The Rhine has also its navigation interrupted by several cataracts, the most dangerous whereof are two in Switzerland; the one near Schaffhausen, where the whole river falls seventy or eighty feet; the other at Lauffen, about a league below, where the water is precipitated down the rocks, with such a prodigious violence, that the noise may be heard in a calm night, at the distance of twelve or fifteen miles. Here the goods put on shore at Schaffhausen, and brought hither by land, are taken in by other vessels to proceed down the river.

Of the natural curiosities of Germany, there is perhaps none more surprising than the Zirchner Sea or lake in Carniola, so called from the neighbouring town of Zirchnitz. This lake is four or five miles in length, and about

two in breadth *, surrounded at some distance with woody mountains, which are full of deer, wild boars, hares, and other game. In the month of June, July, or August, the water of this lake sinks under ground through many large holes at the bottom, leaving it quite dry till October or November, at which time it commonly returns, spouting out of the same holes with such violence, that it sometimes covers the whole vale in twenty-four hours, though at other times it has been known to be three weeks in filling ; but it is a constant observation that thunder and lightning contribute much to fill it speedily. The water however, with respect to its retreat and return, does not observe any certain period ; for sometimes the lake has been dry twice or thrice in a year ; sometimes again, though seldom, it has happened to be three or four years together full of water, but was never known to be dry for a whole year together. The principal pits or holes through which the water retires, are eighteen in number, and at these holes the fishermen lay their nets, and take vast quantities of fish, which would otherwise be carried under ground with the water. The Prince of

* This is agreeable to M. Valvasor's account in the *Philosophical Transactions*, but Dr. Brown gives the lake almost double these dimensions: there is also some little difference between these gentlemen with respect to the time of the waters sinking and rising again, which the Doctor fixes absolutely to the months of June and September.

Ecken-

Eckenberg, who is lord of this lake and the adjacent country, will permit nobody to fish in it when it is full; but when a certain stone appears, which shews that the water is sinking, all those who have a right of fishing, have notice given them to prepare for their business. The pits grow dry one after another, according to their situation, and the lowest of them is generally evacuated in twenty-five days from the beginning of the recess of the water, which is the time the fishing continues. When it is over, a signal is given by tolling a bell, upon which all the inhabitants of the neighbouring villages, and of Zirchnitz, without distinction of age or sex, go into the lake, and look for fish among the weeds and sedge, and in the smaller pits; and many of them find abundance of large fish by creeping into the subterraneous caverns and passages. The fish taken here, which are well-tasted, are chiefly eel-pouts, some of them weighing two or three pounds; tench, some weighing six or seven pounds; and pikes in great plenty, of ten, twenty, thirty, or even forty pounds; and it is usual to find whole ducks in the bellies of the latter: large crabs are found in some of the pits, but they are ill-tasted.

The lake, being thus alternately wet and dry, is of great service to the neighbouring inhabitants; for while it is full of water, it is frequented by wild geese, wild ducks, swans, and other fowls; and when it is empty, it affords them grass for the present sustenance of their

their cattle, and hay for the winter. After the hay is got in, they plow the ground and sow millet, which is sometimes destroyed by the too sudden return of the water, but generally comes to maturity. Whilst the millet is on the ground, they catch a great number of quails, and all the time the lake is dry they have the diversion of hunting and killing the game that resorts to it from the adjacent woods and mountains. Lastly, when the water retires they take abundance of fine fish, as before observed ; and being generally frozen over in winter, so as to bear all sorts of carriages, it is very convenient to the people for fetching their wood and other necessaries.

M. Valvasor accounts for the wonderful phænomena of this lake in the following manner : There is, he supposes, under the bottom of the lake another subterraneous one, with which it has a communication by the several holes above-mentioned. There is also a lake under a neighbouring mountain called Javornick, whose surface is higher than that of the lake of Zirchnitz, and which is possibly fed by some rivulets that bury themselves under ground, which are common in that country. When this upper lake is swelled by great or sudden rains, it finds several caverns in the mountain higher than its usual surface, through which it flows into the lake under that of Zirchnitz, from whence it rises through the holes in the bottom of that lake ; which water again falls away after a long drought,
when

when the springs that feed the upper lake under Javornick are much decreased. That the waters of these lakes are carried off by subterraneous passages, and form a river on the other side of the mountain, M. Valvafor has also made appear beyond dispute.

It is remarkable, that some of the passages through which the water ascends about the lake of Zirchnitz throw up ducks as well as fish, which fowls are supposed to be produced in the lake under Javornick. When they first come out they swim, but are quite blind, and have few or no feathers, so that they are easily caught; but in a short time they recover their sight, and in fourteen days they are fledged, and fly away in flocks. They are black, only white on the forehead, and about the size of the common wild duck. They are well-tasted, but are too fat, having nearly as much fat as lean.

It is observed that in the mountain near this lake there are two very deep holes or precipices, in which wild pigeons roost all winter, and come out in the beginning of the spring; but what they live upon in these caverns is unknown.

The lake of Geneva is in several respects one of the most remarkable in Europe. This lake is shaped like a crescent, one of whose extremities is eighteen leagues distant from the other, and in the broadest part it is about
five

five leagues over. Its depth is very surprising, being in some places, particularly before Rolle, not less than five hundred fathoms; and thereabouts, it is said, a kind of island may be seen under water. The Rhone enters the lake at one of the points of the crescent, and issues out at the other, but with this difference, that whereas it comes in muddy and turbid, it always goes out so pure and clear, that under the bridge of Geneva, where the water is twenty five feet deep in summer, one may see the smallest stones at the bottom. This river, upon entering the lake, loses its rapidity, but some sensible motion is here and there observed, by which its current is distinguished; and soon after its coming out of the lake it resumes its rapid course, which, as its bed becomes narrower, grows consequently more impetuous *. The lake is always higher in summer

* Notwithstanding the rapidity of the Rhone, its course has sometimes been stopped by a strong westerly wind, such as happened in the winter of 1645, which not only uncovered the houses at Geneva, but laid bare the channel of the river above the bridge, so that people passed over dryshod for the space of an hour, after which it resumed its former course. Gallasius, in his Commentary on Exodus, printed 1560, relates that the same accident happened at Geneva, when he was minister there, a south-west wind making the Rhone recoil into the lake, and affording a dry passage for an hour together. Another cause has also some-

mer than in winter by twelve or fifteen feet, commonly beginning to increase about the end of January, and continuing to do so till July or August; which is generally attributed to the melting of the snow and ice from the neighbouring mountains, though probably there is a concurrence of other causes. In calm weather, and even before sun-rising, the lake sometimes appears as if it consisted of several pieces differently coloured, which is thought to proceed from the different images of the adjacent mountains blended together in the water; and there is one part browner than the rest, which is owing to a gentle agitation of the water, caused either by a breath of wind passing through it, or as some think, by springs at the bottom, imparting a tremulous motion to the surface. The lake is plentifully stored with fish, and it is observable that the different species seem to have cantoned themselves as it were, and to have divided it amongst them; trouts being only found in the current of the Rhone, carp near Vevay, &c. but some fishes that are only passengers, and not inhabitants of the lake, spread themselves all over it indifferently. The trouts taken here are very large, some of them weighing fifty pounds;

sometimes interrupted the course of this river; for in December 1652, the Arva, which falls into the Rhone a little below Geneva, swelled to such a degree, that it not only overflowed its banks, but forced the Rhone back into the lake for the space of fourteen hours.

and

and sometimes they catch pikes of eighty pounds weight, and the pound at Geneva is eighteen ounces. There are many other lakes of considerable extent in these countries ; which, as they are not remarkable for any cur iosity, it is not necessary to take particular notice of.



S E C T.



S E C T. III.

An Historical Account of the most remarkable Earthquakes, Inundations, Fires, and other public Calamities, which, at different times, have visited the Inhabitants of Germany, Bohemia, Hungary, and Switzerland.

IT does not appear that these countries have suffered much from earthquakes : we are however told, that, about a century ago, an earthquake happened at Lausanne, in the canton of Berne in Switzerland, which rent the wall of the great church in that city from top to bottom : but what is most remarkable was, that, about ten years afterwards, there happened another shock of an earthquake, which closed up the rent in the church wall, though it was above a foot wide, so as to be scarcely discerned. Mr. Addison was told, on his journey through this city, that there were several persons then living who had passed through the rent.

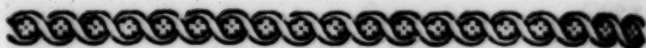
The town of Chiavenna, in the county of the same name, in the territories of the Grisons, in Switzerland, stands upon the river Maira, and was formerly much larger than it is now, all the north part of it having been buried by the fall of a mountain, in the twelfth century.

Pleurs, a town north-east of Chiavenna, and near the same river, was, about two centuries ago, totally destroyed by an inundation of water ; upon which, such of the inhabitants as survived the destruction of their town, removed to the banks of the river Maira, about a league from Chiavenna, where they built a new town, which, in time, was well inhabited, and reckoned one of the finest towns in Italy : but on the 25th of August 1618, it was destroyed by as fatal and sudden an accident as any recorded in history : for part of a neighbouring mountain, having separated from the rest, and falling upon the town, buried it with all its inhabitants, consisting of between 1500 and 2000 persons. The inhabitants of Chiavenna knew nothing of this catastrophe, till they perceived the river sink : the usual channel having received no water for upwards of three hours, because the mountain, by its fall, had changed the usual course of the river. Among the other buildings overwhelmed by this ruin was a most magnificent palace, belonging to the family of Francken, which cost several millions of crowns ; and here were a great many other noble structures, built by the rich factors of Milan, who chose this for the place of their retirement, and who, it is said, led a riotous and luxurious life. Dr. Burnet was told, that a Protestant minister warned them from the pulpit of the terrible judgment which he believed would break out upon them ; and it is said, that, when the mountain was parting, one of the inhabitants of the town gave the alarm,

alarm, by declaring that he perceived the mountain separating : however nobody minded him, and he could only prevail upon his daughter to leave the town with him : but the daughter, returning back, to lock the door of a room, in which she had left some things of value, was destroyed with the rest of the inhabitants, before she had time to escape : it does not however appear what became of her father, who gave the alarm.

The city of Friedburg, in the landgraviate of Hesse, has suffered so much from fires, that it is now reduced to one half the extent of ground which it formerly took up ; the church, which before those fires stood in the middle of the city, being now out of the town, and on the other side of the high road. One of those terrible fires, which reduced this place, happened in the year 1383, and burnt 900 houses ; another broke out in the year 1447, and destroyed 700 houses.

In the city of Franckfort, in the Wetteraw, a fire happened in 1719, which destroyed upwards of 500 houses : but 4000 houses were consumed in 1184, by a fire which broke out in the city of line in Swabia ; and the city of Presburg, in Hungary, has greatly suffered from fires, particularly in the years 1515, 1563, 1590, and 1642. But enough of such dismal relations.



S E C T. IV.

An Account of the most celebrated Inventions, Discoveries, &c. of the Inhabitants of Germany, Bohemia, Hungary, and Switzerland.

AMONG the philosophers of these countries, the most celebrated appears to be Godfrey William de Leibnitz, who was born at Leipzig in Saxony, in 1646, and whose father Frederic was professor of moral philosophy, and secretary to the university of that place. He entered upon his academical studies at fifteen years of age; and to that of polite learning joined philosophy and the mathematics. He applied himself particularly to the study of the Greek philosophers, and engaged in the task of reconciling Plato with Aristotle, as he afterwards attempted a like reconciliation between Aristotle and Des Cartes. Having, in the course of his mathematical studies, observed the imperfection of Mr. Pascal's arithmetical machine, which that learned person did not live to finish, he invented a new one at Paris, the use of which he explained to Mr. Colbert, who was extremely pleased with it; and the invention being approved likewise by the Academy of Sciences at Paris, he was offered a seat there as a pensionary member. The year following, 1673, he took a tour to England, where he became

became acquainted with Mr. Oldenburg, secretary, and Mr. John Collins, fellow of the Royal Society, from whom he received some hints of the invention of the method of fluxions, which had been discovered, in 1664, or 1665, by Sir Isaac Newton, which hints Mr. Leibnitz so well understood and improved, that he claimed the honour of the discovery*.

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* The state of the dispute between Leibnitz and Newton, in regard to this noble invention, is as follows: Newton, having discovered his method of fluxions, communicated it to Dr. Barrow in 1669. Leibnitz affirmed he had some notions of it in 1672, before he had seen any hint of Newton's prior discovery, which was communicated by Mr. Collins to several foreigners in 1673, the beginning of which year Mr. Leibnitz was in England, and commenced an acquaintance with Mr. Collins, and at that time only claimed the invention of another differential method, properly so called, which indeed was Newton's invention, but mentioned not his having any other, till June 1677, which was a year after a letter from Newton, containing a sufficient description for any intelligent person of the nature of the method had been sent to Paris, to be communicated to him: however nothing of it was printed by Sir Isaac, which being observed by the other, he first printed it under the name of the differential, or infinitesimal method, in the *Acta Eruditorum* of Leipzig, for the year 1684; and as he still persisted in his claim to the invention, Sir Isaac, at the desire of King George the First, gave his Majesty an account of the whole affair, and sent Mr. Leibnitz a defiance in express

In the year 1700, the Elector of Brandenburg, afterwards King of Prussia, having founded an academy at Berlin, appointed Mr. Leibnitz perpetual president of it; and though his other affairs did not permit him to reside constantly upon the spot, yet he made ample amends by the treasures with which he enriched their memoirs, in several dissertations upon geometry, polite literature, natural philosophy, and physic. He afterwards set himself to invent a language so easy, and so perspicuous as to become the common language of all nations in the world: but though he laboured in this vast project, from the year 1703, yet his life did not prove sufficient to complete it, having died in 1716. He was famous over all Europe, and wrote many pieces. Michael Gordius Hanschius collected, with great care, every

terms, to prove his assertion. This was answered by Leibnitz in a letter which he sent to Mr. Raymond at Paris, to be communicated to Sir Isaac, after he had shewn it in France; declaring that he took this method in order to have indifferent and intelligent witnesses. That method being disliked by Sir Isaac, who thought that London as well as Paris might furnish such witnesses, he resolved to carry the dispute no farther; and when Mr. Leibnitz's letter came from France, he refuted it, by remarks which he communicated only to some of his friends; but as soon as he heard of Mr. Leibnitz's death, which happened six months after, he published Mr. Leibnitz's letter with his own remarks, by way of supplement to Mr. Ralphson's history of fluxions.

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thing that Mr. Leibnitz had wrote upon the principles of philosophy, and formed a complete system, under the title of *G. G. Leibnitzii Principia Philosophiæ, more Geometrico demonstrata*, &c. published in 4to at Franckfort, in 1728.

John Kepler, who was born at Wiel, in the duchy of Wirtemberg, in 1571, was one of the greatest astronomers that perhaps any age has produced. In 1626, he finished and published the Rodolphine tables, begun by the famous Tycho Brahe. In 1629, he published the second part of his Ephemeris, the first part having been published in 1617. He published many other pieces upon the subject of astronomy, in which he made such noble and important discoveries, that he might have claimed the honour of having laid a solid foundation for physical astronomy. He has endeavoured to demonstrate, that the planets do not move in circles, but in ellipses, in one of whose focuses is placed the sun; and that their motions are regulated according to these two laws; first, that they describe equal areas in equal times; and secondly, that the squares of their periodical times are as the cubes of the distances; both which are well known to be fundamental principles in the Newtonian astronomy. In the introduction to his commentaries, he discovers plainly enough, that he had a tolerable good notion of gravity: for he compares the sun to a magnet, whose power diffused carries round the planets; and he also
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supposes the moon's attraction to be the cause of the tides. In the year 1618, he published his *Epitome Astronomiæ Copernicanæ*, in which he discovers some very singular notions. He died in the year 1630.

Amongst the inventions of the Germans is that noble instrument the air-pump, to which the present age is indebted for so many fine discoveries, and which is ascribed to Otho de Guerick, a consul or burgomaster of Magdeburg, who exhibited his first experiments therewith before the Emperor and the States of Germany at Ratisbon, in the year 1654. It is true, some have ascribed the invention to the honourable Mr. Boyle, and the engine has obtained the name of *Machina Boyleana*; but this is rather on account of the improvements made in it, or the various experiments it was applied to, by that great philosopher: for though he had actually made some attempts of this nature before he knew any thing of what was done in Germany, yet he ingenuously confesses de Guerick to have been beforehand with him, and that it was the information he afterwards received from a book published by Schottus, containing an account of de Guerick's experiments, which enabled him to bring his design to maturity. This machine has been of late years much improved by the ingenious Mr. Hawksbee and others, and seems now to be carried to its utmost perfection.

The use or effect of the air-pump is to exhaust the air out of any proper vessel, and thereby make what is popularly called a vacuum, which in reality is only such a degree of rarefaction as is sufficient to suspend the ordinary effects of the atmosphere *. Hence therefore we learn, in some measure, what our earth would be without the mass of air which surrounds it, and how necessary it is to the life, generation, and nutrition both of animals † and

* The rarefaction or dilatation of the air by its own elasticity, without the help of any heat, is found to be very surprising. In several experiments made by Mr. Boyle, it dilated first into nine times its former space, then into 31 times, then into 60, and then into 150. At length, by many degrees, he brought it to dilate into 8000 times, then into 10000, and at last into 13679; and yet we know not how much farther it is capable of being expanded. Hence it appears, that the air we breathe, near the surface of the earth, is compressed by its own weight into at least the 13679th part of the space it would possess if it were at liberty. But if this air be condensed or compressed by art, the space it takes up, when most dilated, is to that it possesses when most condensed as 550000 to 1, according to the same author's experiments.

† Even the inhabitants of the waters need air as well as those of the land, though not in the same quantity; for it is known that fishes use respiration, by passing the water through their gills, which to them do the office of lungs in other animals.

It is remarkable that some fishes, as eels, will live a long time out of the water; and we are assured that in Holland they have a way of fattening carp,

and vegetables, and to other various purposes, in which we are apt to think it is not at all concerned.

The principle on which this machine is founded is the elasticity or spring of the air; and the basis or essential part of it is a metal-line tube, answering to the barrel of a common pump or syringe, having a valve at the bottom opening upwards, and a moveable piston or embolus, answering to the sucker of a pump, furnished likewise with a valve opening upwards; the whole properly fitted to a vessel as a receiver, from whence the air is to be exhausted. The other parts of it, chiefly respecting conveniency, have been diversified and improved from time to time; and particularly Mr. Hawksbee, by adding a second barrel and piston to the former, to rise as the other falls, and fall as it rises, has made the working of the engine much easier than it was before. To this gentleman we are indebted for the structure of the air-pump now in common use; but Mr. Martin has lately contrived one of a different form, which he calls a portable air-pump, being so constructed that it may, together with its receivers, be contained in a box of a small size, and sold at a small price in comparison of those before invented.

carp, by hanging them up in a cellar or other cool place, in a net full of wet moss, with their heads out, and feeding them with white bread and milk for many days; which method has also been practised in England.

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The reader must observe, as has been already hinted, that an absolute vacuum cannot be obtained by the air-pump, i. e. all the air cannot be exhausted out of the receiver, be the pump ever so good, or worked ever so long; for as the air which is drawn out is only expelled by the spring of that which remains behind, if we suppose every particle to be exhausted, the last must be expelled without an agent, or there would be an effect without a cause, the absurdity whereof is evident. However, the air is dilated by this machine to such a degree, that bodies placed in an exhausted receiver are usually said to be *in vacuo*; and by this means a vast number of curious experiments have been made, which have given great light into the secrets of nature, and of which, if a few of the most remarkable are mentioned, it perhaps will be an agreeable entertainment to those who are unacquainted with such phenomena.

First then, to demonstrate the spring of the air, if a bottle whose mouth is securely sealed, so that no air can escape from within, be placed under a receiver, and the air exhausted from the surface of the bottle, the spring of the included air will burst it to pieces. 2. If a bladder be almost emptied of air, and tied very tight, the air within will expand itself *in vacuo*, so as to make the bladder appear full-blown. 3. By making a little hole in the small end of a new-laid egg, and exhausting the receiver, the bubble of air contained between

tween the shell and skin at the great end will expand itself so as to force the white and yolk of the egg through the hole ; and if half the shell of the egg thus emptied be taken off, the said bubble will raise up the skin so as to resemble an entire egg. 4. A shrivelled apple will become smooth and plump under the exhausted receiver, by the expansion of the air contained in its substance. 5. Fishes are made so light by increasing the spring of the air in their bladders, upon exhausting the receiver, that they rise to the top of the water, and cannot again descend to the bottom *. 6. Water heated as hot as the finger can well bear

* It is a rule in hydrostatics, That a body heavier than so much water as is equal to it in bulk will necessarily sink, that a lighter will swim, and that a body of equal weight will rest in any part of the water. Now, by this rule, if a fish in the middle region of the water be of equal weight with the element, bulk for bulk, the fish will remain there without any natural tendency upwards or downwards ; and if the fish be deeper in the water, its bulk becoming less by the compression of the bladder, and yet retaining the same weight, it will sink and rest at the bottom. On the other hand, if the fish be higher than the middle of the water, the air of the bladder dilating itself, and the bulk of the fish consequently increasing, but not its weight, it will rise upwards, and rest at the top of the water.

Probably the fish, by some action or other, can emit air out of its bladder, or take it in, as there

bear it, will boil vehemently under the exhausted receiver; but upon letting the air in again the agitation ceases. 7. Fresh small beer placed *in vacuo* rises up in froth, dies, and loses all its taste. 8. Vegetable substances put in water under the receiver emit great quantities of air from all parts of their surface. 9. The weight or pressure of the air is shewn by exhausting two hollow brass hemispheres, which are then compressed together by the external air so as to require a force to pull them asunder equal to one hundred and eighty-eight pounds, if the diameter of the hemispheres be four inches. 10. A person placing his hand on the top of an open receiver, will very sensibly feel the pressure of the air on the back of his hand, in proportion as the receiver is exhausted: and the spring of the air contained in the flesh exerting itself at the same time, the inside of

is occasion; for Mr. Ray observes, that in most fishes there is a manifest channel from the gullet to the bladder, which doubtless serves for the conveyance of air; and there is a musculous power in the coat of the bladder, whereby the fish can contract it when it pleases.

In confirmation of what has been said with respect to the use of the swimming-bladder in fishes, the same gentleman adds, that if the bladder happen to be pricked or broken, the fish cannot raise or support itself, but immediately sinks to the bottom; and that soles, plaice, and other flat fishes, which always lie groveling at the bottom, have no such bladder that ever he could discern.

his hand swells downwards into the receiver*. 11. If the air be exhausted from a thin bottle placed under a receiver, and then suddenly let in again, its weight will instantly reduce the bottle to very small pieces. 12. If a piece of wood be cemented in the lower part of the neck of an open receiver, and mercury poured upon it, after two or three exhaustions the pressure of the external air will be so great on the mercury, as to cause it to descend through the pores of the wood in form of a beautiful shower, which will shine in a dark room. 13. The lightest and heaviest bodies descend with equal velocity *in vacuo*: thus a guinea and a feather, let fall from the top of a tall exhausted receiver, arrive at the bottom both

* The vast weight or pressure of the air, which indeed we do not feel, but are made fully sensible of by philosophical experiments, is a matter that must lead us to admire the infinite wisdom of the great author of nature. It is computed that twenty-nine inches and a half is the mean altitude to which the mercury rises in the barometer by the pressure of the air, and consequently its weight is taken for the mean weight of a column of air of the same base, and as high as the atmosphere. Now a column of mercury whose base is one square inch, and height twenty-nine and a half, weighs about fifteen pounds, which is therefore equal to the pressure of the air on every square inch, and then upon every square foot it will be 2160 pounds. In this proportion the air presses upon all bodies on the surface of the earth; and therefore allowing fourteen square feet and a half

both together. 14. It appears that air is necessary to the existence of fire and flame; for a piece of burning charcoal, or a lighted candle, is presently extinguished in the exhausted receiver; neither will gunpowder flash, or make any explosion therein, but melt and die away. 15. Air is likewise shewn to be the medium of sounds; for a bell rung *in vacuo* is not heard, but as the air is admitted into the receiver, the sound increases in proportion. 16. That fermentation and putrefaction depend on the air, is shewn by preserving fruits in their native bloom and perfection through the winter in an exhausted glass: and eggs, which in the air soon grow stale and putrid, retain their goodness a long time *in vacuo*.

half for the superficies of a man's body, it must sustain a pressure of 31320 pounds, when the air is of a mean gravity. This prodigious weight would crush us into a very small compass, but that it is equal on every part, and counter-balanced by the equal re-action of the springs of the air within us.

The difference of the weight of the air which our bodies sustain at one time more than another is also very considerable, being about 2500 pounds less when the air is lightest, than when the air is heaviest; which difference of pressure must greatly affect us in regard to the animal functions, and therefore it is no wonder we sometimes suffer in our health by a change of weather: nay, when we consider that this variation is often very sudden, it is surprising that every such change does not break the frame of our bodies to pieces.

17. How necessary air is to vegetation appears from hence, that seed sown in earth kept under an exhausted receiver will not grow at all*. 18. Air is likewise absolutely necessary to most sorts of animals, though some will live a long time *in vacuo*, whilst others expire presently†.

The same Otho de Guerick, who invented the air-pump, contrived a new sort of air-gun,

* A trial of this was made by sowing some lettuce-seed upon some earth in the open air, and some of the same seed, at the same time, upon other earth in the glass-receiver of the air-pump, which was afterwards exhausted. The seed exposed to the air grew up an inch and half high within eight days, but that in the exhausted receiver did not appear. The air being then re-admitted into the receiver, in the space of a week the seed sprung up to the height of two or three inches. See Phil. Transf. N^o. 23.

† Dr. Derham observed, from divers experiments he made, that animals whose hearts have two ventricles and no *foramen ovale*, as birds, dogs, cats, rats, mice, &c. die in less than half a minute under a small exhausted receiver. A mole died in one minute: a bat remained *in vacuo* four minutes and a half, and revived upon re-admitting the air; but in twenty minutes he was dead beyond recovery. Wasps, bees, grasshoppers, and other insects, appeared dead in two minutes; but revived in the open air, after they had lain twenty-four hours *in vacuo*. Snails continued twenty-four hours under the exhausted receiver, and seemed

gun, which discharged shot by the rarefaction of the air, whereas the common air-guns produce their effects by its compression. Dr. Papin improved upon de Guerick's invention, and experiments were made before the Royal Society to try the force of his machine; which was very considerable, but not equal to those whose structure is founded on the compression of the air. Of these the most common and portable kind consists of two barrels, one of a small bore, into which the bullet is rammed as in other guns, and another on the outside of this, so large as to leave a space between them, wherein the air is to be inclosed. Into this cavity the air is injected through a valve by a syringe fixed in the stock of the gun, and the discharge is made by drawing a trigger, which opens another valve, whereupon the compressed air rushes through a hole into the inner barrel, and expels the bullet with great violence. There is also a contrivance in the lock, that either the whole charge of air may be spent at

seemed not much affected. Frogs and toads bear the pump a long time, especially the former; one of which recovered in the open air, after remaining eleven hours in the receiver. Fish are not easily killed by the air-pump: at first they appear greatly disturbed, swollen, and sickish; but Mr. Hawksbee says he has kept them a week *in vacuo*, and found them as lively as those which had been kept as long in the air.

Slow-worms, according to Mr. Boyle, will live two or three days *in vacuo*, and leeches five or six.

one explosion, or only part of it, and the rest reserved for fresh bullets ; but the force is much the greater, if all the air be discharged upon one single bullet.

The magazine air-gun is so contrived, that ten bullets, lodged in a cavity near the place of discharge, may be drawn one by one into the shooting barrel, and successively exploded in a very expeditious manner. Dr. Burnet takes notice of a gunsmith at Basil, who shewed him one of these machines, and pretended the invention was his own, which must be acknowledged to be curious ; but as the discharge of air-guns is attended with an inconsiderable report compared to that of fire arms, nor is there any flash like that of gunpowder to discover from what hand the shot comes, it seems the interest of mankind, as the Doctor observes, to forbid the use of instruments so convenient for private assassinations.

The Germans have been famous for their improvement of the art of chemistry, which is that of separating by means of fire the several substances of which mixed bodies consist, and of composing new bodies by the mixture of different substances or ingredients. If we endeavour to find the origin of this art, we must look back into the antediluvian world, where it was practised, as some think, by Cham the son of Noah ; but the invention is more commonly ascribed to Tubal Cain, who first prepared brass and iron for the use of man, which
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he could not have done without a competent knowledge of chemistry. Profane authors refer it to Vulcan; and several learned men have made it appear very probable that Tubal Cain and Vulcan were the same, which seems to be confirmed by the great resemblance between their names. The next chemist we read of is Moses, whose skill in this art is evident from his burning and pulverizing the golden calf, and giving it the people to drink; for the rendring gold potable is one of the most difficult operations in chemistry: but we are rather inclined to think this was done by a miraculous power. The invention of chemistry is by others referred to Hermes Trismegistus, an antient King of Egypt, from whom it has obtained the name of the Hermetic art. From the Arabians, by whom the art was esteemed and practised, it seems to have had the name of alchemy; but these people rendered it ridiculous by their extravagant superstitious reasonings, and their pretended transmutation of metals. And here it is to be observed, that chemistry at first had only metals for its object, whereas the bounds of it have been much enlarged in later ages, being extended to the animal and vegetable as well as the mineral kingdom; and the moderns have applied it with great success to the preparation of medicines for curing the diseases of the human body.

At the decienſion of the Eaſtern empire chemistry ſhared the common fate of the other arts,

arts, and lay buried and neglected till the time of our friar Bacon, by whom it was in a good measure retrieved. He was followed by Raymund Lully, Basil Valentine, Paracelsus, Van Helmont, and others, who spread the art in Spain, Italy, and Germany; and the two last especially carried it to such a length, as to render medicine almost wholly chemical. Lermery a Frenchman, Homberg a German, and our ingenious countryman Mr. Boyle, dispersed the darkness of the art, reducing it to simple and true ideas, and abolishing those useless and impracticable circumstances, with which some of their predecessors had designedly clogged its operations. But of all the moderns none have made greater improvements in chemistry, or more judiciously and beneficially introduced it into medicine, than the late celebrated Boerhaave; who is also the fullest and best writer on the subject, having given us the history, theory, and practice of this noble art in an orderly and scientific manner.

It is well known that the chemists, or rather alchemists of Germany, and several other countries, have employed much time and pains in search of what is properly called the Philosopher's stone, or a preparation capable of transmuting or exalting impurer metals, as tin, lead, and copper, into gold and silver*. An-
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* Borrichius, a learned Dane, has taken great pains to prove that alchemy was known to the
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other object of their studies has been to find out an universal medicine, adequate to all diseases, sometimes called by way of eminence, the Grand Elixir: but most alchemists are of opinion that these two things coincide, so that
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antient Greeks and Egyptians; and Conringius, with equal address, has endeavoured to shew its novelty. Kircher asserts, that the Egyptians were not ignorant of the art; but he adds, that the secrets of it were confined to the royal family, and handed down traditionally from father to son, without being committed to writing or made public: and yet some authors observe, that Dioclesian, after the taking of Alexandria, ordered all the books written by the Egyptians to be burnt, wherein the great mysteries of chemistry were contained, that it might not be in their power to enrich themselves by that art, and thereby put themselves in a condition of revolting. Be this as it may, the first writer we know of that speaks of making gold is Zosimus the Panopolite, who lived towards the beginning of the fifth century, and who has an express treatise on the divine art of making gold and silver, still extant in manuscript in the French king's library. Gazeus, another Greek writer, towards the end of the same century, tells us, that 'such as are skilled in the ways of nature can take silver and tin, and change them into gold.' Hence it appears, that some such art as alchemy was in being in that age, but neither of those authors relate how long it had been known before. After this time writers on the subject of alchemy are more frequent, and particularly Geber the Arab, who is supposed to have lived in the seventh century, has a treatise on the
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what will make gold will cure all distempers*.
The making of gold has been attempted three
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Philosopher's stone, from whence the hint of an universal medicine seems to have been taken. But we do not find this mysterious part of chemistry brought into much reputation till the fourteenth or fifteenth century, when it spread itself throughout Europe: and since that time almost every nation has had its adepts in alchemy, who have laid claim to the secret of the Philosopher's stone, or a medicine to cure all diseases. Such were the society of Rosicrucians in Germany, to name no more, who pretended not only to be masters of the Philosopher's stone, but to be able to protract the period of life, and even to restore youth, by means of certain nostrums, with other pretensions equally extravagant.

* Kircher affirms, that the antient Egyptians had a method of drawing an elixir from the hardest and most precious substances, which, on account of its subtilty and perfection, they called heaven: and this he takes to be that admirable celestial water, capable of removing all diseases, called also the Philosopher's stone, the Vegetable Seed of Nature, the Solar Soul, &c. But the judicious Boerhaave explodes the notion of a Panacea, or universal medicine; and shews, from the different causes, natures, effects, seats, and other circumstances of diseases, that several may be cured by one medicine, but all by none. He observes, that the most universal remedies known are water, fire, mercury, and opium; and that by these alone, cautiously disguised, some have acquired the reputation of universal physicians.

different ways, *viz.* first by separation; for every metal yet known contains some gold, but in most of them the quantity is so little, that it will not defray the expence. The second is by maturation, or ripening, which relates only to quicksilver; for the alchemists hold mercury to be the basis and mother of all metals, that its weight might be increased by purging it from all heterogeneous bodies, and that by subtilizing, purifying, and digesting it, with much labour and long operation, it might be converted into pure gold. Weight is the inimitable character of gold; but could the impurities of mercury be quite purged out, which does not appear impossible, it would, say the alchemists, be as heavy as gold itself; and what is as heavy as gold is gold, or at least might be made such without any difficulty. The third method is that of transmutation, or a way of turning all metals into gold, by melting them in the fire, and casting into the fused matter a small quantity of a certain preparation, upon which the impure parts are immediately volatilized, burnt and carried off, and the remaining mass changed into pure gold. Now that which works this change in the baser metals is what is meant by the Philosopher's stone, and is the grand secret in alchemy, yet undiscovered, though several have pretended to be masters of it, whose veracity on other occasions is not to be questioned.

The possibility of this transmutation, or rather perfection of imperfect metals, as some would have it called, is a point much disputed among philosophers, the alchemists strenuously maintaining the affirmative, on a supposition that all metals would equally arrive at perfection, as being composed of the same matter, were it not for the impurity of their matrices, that is, of the places where they are formed by nature. All that is required, say they, in the business of transmutation, is to do that by art, which nature does in many years or ages. But how is this to be effected? How is so impure a metal as lead for instance, to be exalted into gold? Why, if we consider the weight of lead, there is nothing in nature so heavy, gold and mercury only excepted; whence it is plain there is something in lead that comes very near to gold, but there is also some heterogeneous matter different both from gold and mercury. Now if we had any body which would so agitate the parts of lead as to purge off all that is not pure mercury, and had some sulphur to fix the mercury, would not the mass be converted into gold? If eleven ounces of lead be dissolved by the fire, and so purified as to come to fourteen, we shall then have changed it into mercury, which is specifically heavier than lead in that proportion; and if we farther purify the mercury from fourteen to nineteen, the ordinary ratio of the weight of gold to that of mercury, we shall then have gold; provided, as before observed,

observed, we can find a sulphur to fix the mercury *.

Such is the foundation of the Philosopher's stone, which the alchemists hold to be a

* The fixing of mercury, among alchemists, denotes the rendering it capable of bearing the fire without evaporating, and of enduring the hammer. This they suppose is to be done by a certain sulphur, the common cement of all metals; and could they find this out, they would be able to make gold, or at least silver.

We have an account, in the Memoirs of the Royal Academy of Sciences, of a chemical operation made by M. Homberg, on the fæcal matter, or human excrements discharged by stool: which it was suggested to him would yield, by distillation, an oil clear as water, and without any smell, that had the property of fixing mercury into fine silver: to procure as promising a matter for this experiment as he could, he agreed with four healthy young fellows, whom he shut up for three months, that they should eat nothing but the finest bread, which he supplied them with fresh every day, and drink the best champaign. After a long process, and numerous essays on the excrements they made, he obtained the clear inodorous oil; but it had no effect on the mercury, which was the great point in view. However, though he missed his aim, he fell on something he did not dream of, *viz.* a Phosphorus; for he found that the *caput mortuum* of the oil (so the chemists call what remains in the retort) had the surprizing property of taking fire of itself, being laid on paper or other combustible matter.

most subtle, fixed, concentrated fire, that unites itself by a magnetic virtue to the mercurial body of any metal it meets with, volatilizes and throws off all its impurities, and leaves nothing but a mass of pure gold behind.

This is the grand secret, which alchemists of various nations, encouraged by kings, princes, and nobles, have been in diligent search of for many ages. Vast sums of money have been advanced, and innumerable experiments have been tried for this purpose; but all the learning, labour, and expence employed about it have not yet been able to make the expected discovery.

Paracelsus, who was born in the year 1493, at a village called Einsidlen in Switzerland, about two German miles from Zurich, pretended to be possessed not only of the Philosopher's stone, but also of the Grand elixir, by the use of which he promised himself that he should live to the age of Methusalem: but the great reason for doubting the truth of such pretensions is, that he died at the immature age of eight and forty years.

The genius of the Germans has appeared in the invention or improvement of several mechanical arts, and amongst others they lay claim to the honour of having invented the curious and useful art of Printing. This art is said to be of a very antient standing in China, but

but then their manner of printing is quite different from that which obtains in Europe; though it must be owned the European printing, in its infancy, was much the same with the Chinese. However, as there was then no correspondence between Europe and China, the passage into the East by the Cape of Good Hope being undiscovered, there is no reason to charge the Europeans with having borrowed their art from the Chinese, but each may be allowed to have fallen upon the same invention, though at very different times.

Printing, according to Father Le Comte, has been known in China from the earliest ages; but the great difference between their printing and ours is this, that whereas we have but a small number of letters in our alphabets, by the various arrangement whereof we can form infinite volumes, so by making our characters moveable, we are able to print the largest works with an inconsiderable quantity of letter, the same which served for the first sheets serving also for the succeeding ones, by being separated and placed in a different order. The Chinese, on the contrary, by reason of the prodigious number of their letters*, find it
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* The art of joining letters to form words, and of combining the one and the other an infinite number of different ways, is a secret unknown to the Chinese. At first, like the Egyptians, they used hieroglyphics, and painted
P 2 rather

more easy and less expensive to cut them on wooden blocks, making as many blocks as there are pages in the book they intend to print, and

rather than wrote, striving by the natural images of things, as a bird, a tree, &c. to express and communicate their ideas to one another. But this manner of writing was not only very inconvenient, but imperfect, as they could but express their thoughts by halves, and what they did express was frequently liable to be misunderstood; not to mention the room these pictures took up, which obliged them to write a great deal to say a very little matter. To remedy these inconveniencies, they changed their way of writing by degrees, and even invented several characters to express things that did not come within the reach of painting to represent, as the passions, thoughts, voice, taste, and a thousand other objects without body or figure. From simple strokes they framed others more compound, and contriving one or more characters for every word, they multiplied their letters almost to infinity. This seems to be the source of that ignorance we find among the Chinese, so great a part of their lives being spent in learning their letters, that they have not time to apply themselves to the study of things, but think themselves learned if they are able to read. Nay, we are told, that scarce any of them know all their letters; and father Le Comte is of opinion, the greatest doctor amongst them never understood half their letters perfectly, for he reckons the whole number to be eighty thousand. This is a prodigious inconvenience to foreigners, and much complained of by the missionaries in that country.

and these are of no farther use but for that single work.

Who was the first inventor of printing in Europe, in what city and what year it was first set on foot, is a question long disputed among the learned, and not yet thoroughly decided. The cities of Mentz and Strasbourg, and that of Haerlem in Holland, are the warmest on this point of honour, but Mentz has always had the majority of voices ; and as this is a city of Germany, it is thought proper here to propose the pretensions of each, without entring into a nice disquisition of the merits of the cause.

John Mantel of Strasbourg, John Guttembergh and John Fust of Mentz, and Laurence John Koster of Haerlem, are the persons to whom this invention has been most frequently ascribed, but the first seems to have had the fewest advocates.

Mantel however, a French physician, enters the lists in behalf of his name-sake, and contends that he first invented printing in the year 1442, in consideration whereof the Emperor Frederic the Third gave him a suitable coat of arms ; and he adds, that Guttemberg, whom he had made his associate, carried the art to Mentz, where he took in Fust as a partner.

Boxhornius, Schrevelius, and other authors, refer the invention to Koster of Haerlem, in the year 1430, adding, that Fust stole away Koster's materials, and set up printing at Mentz, assisted by his servant Peter Schoeffer, who afterwards married his daughter, and became his partner in the business; but others ascribe this theft to Guttemberg.

Polydore Virgil, Pasquier, &c. will have Guttemberg to be the inventor of printing; but Naude espouses the cause of Fust, whom he makes the first printer in Europe. His reason for ascribing the invention to Fust is, that his name appears in the most early printed books, as in the Latin Bible of 1462, Tully's Offices of 1465, and perhaps some of a prior date; and if Guttemberg or Koster had a greater or an equal share in the invention, it is more than probable they would not have allowed him to attribute the whole to himself and his son-in-law Schoeffer, as he has done, without contradicting him, and asserting their own right. He adds, that whatever is urged in behalf of Guttemberg, Mantel, or Koster, is only founded on reports, conjectures, and forged authorities.

But the dispute is not thus terminated: the advocates for Koster make use of various arguments in his favour. Mr. Ellis, in his Philosophical Transactions, gives an account of books printed by Koster of an earlier date than any hitherto referred to Fust, and some even as early

early as 1430, and 1432. At Haerlem, it is certain, they shew printed books of that date, which seem to Mr. Ellis to put it out of doubt that the honour of the invention belongs to Koster, and that Fust only established the art in greater perfection at another place many years after. Besides, it is allowed on all hands, that the *De Spieghel onser Behoedinge*, or *Mirror of our Salvation*, which is shewn at Haerlem for the first printed book, could never be Koster's first essay. He must have made many trials on lesser works, and undoubtedly his first attempts were on loose and small leaves, which we may suppose were easily lost. Upon the whole, it is no inconsiderable argument in Koster's behalf, that the rudest and most artless performances in printing seem to be his ; of which kind some things without date are to be seen in the British Museum, and in the Bodleian library at Oxford. They have the marks of the utmost simplicity, and may be reasonably taken for first essays, being awkward and coarse, and the ink only common writing-ink, which was unartfully spread upon wooden blocks, cut in a very clumsy manner.

Whoever therefore were the first printers, or whencesoever the hint was taken, such was the art in its original state, several pieces in the Bodleian library and that of Bennet's college being printed in this way ; and the impression appears to have been made only on one side of the leaves, after which the two blank sides were pasted together. But this method of printing

printing upon wooden cuts being found inconvenient, it was not long before an improvement was thought of, viz. the making of single moveable letters, which was first done in wood, and afterwards in metal; from which last invention we ought to date the origin of the present art of printing, as practised throughout Europe. This ingenious contrivance of casting single types in metal, is generally ascribed to the above-mentioned Schoeffer, first servant, afterwards partner and son-in-law of Fust, at Mentz in Germany; so that he was properly the first printer, as well as letter-founder; and, strictly speaking, the Bible, printed with moveable types in 1450, or thereabouts, was the first printed book *, which was soon followed by editions of Augustin De Civitate Dei, the Vocabulary called Catholicon, Tully's Offices, and several other works.

From Mentz the art of printing spread itself in a short time through great part of Europe, and is commonly said to have been brought

* It is said that Fust, or Faustus, as some authors call him, carried a parcel of his printed bibles to Paris, and offered them to sale as manuscripts; but the French, considering the number of the books, and their exact conformity to each other, even to a point, and that the best book-writers could not come up to such exactness, concluded there was witchcraft in the case, and by indicting him as a magician, or threatening to do so, obliged him to discover the secret. Hence the origin of the popular story of Dr. Faustus.

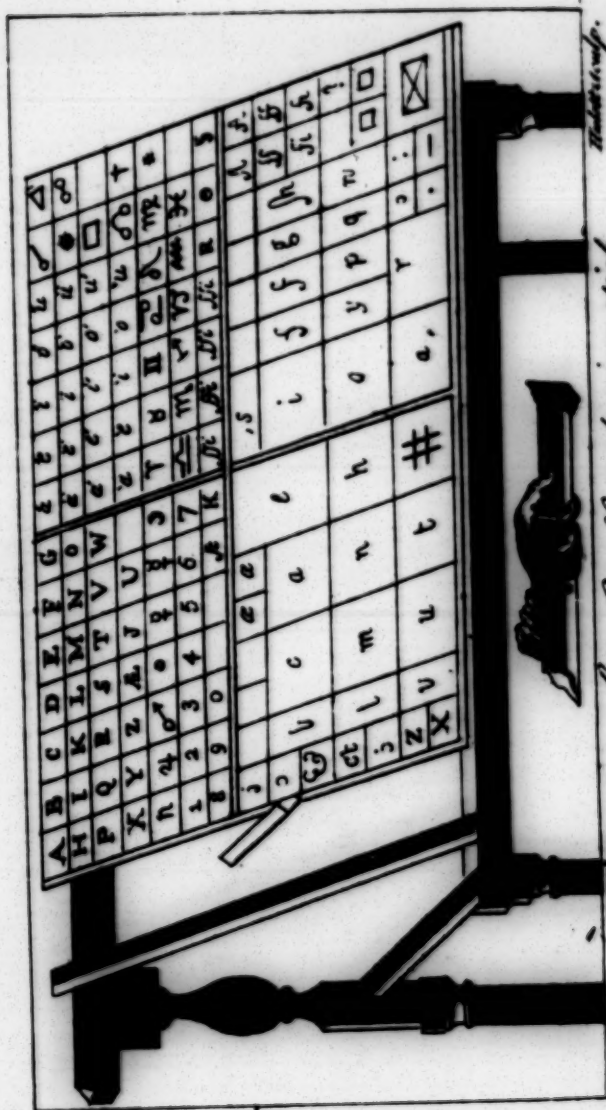
into

into England from Haerlem in 1468, by William Caxton, a merchant and citizen of London, who having been abroad in the Low Countries for many years, not only got an insight into the business, but prevailed with one of the workmen to come over and set up a press at Oxford, where an edition of Ruffinus on the Creed was printed the same year. In 1470, Caxton is thought by some to have brought the art to Westminster; but a modern antiquary seems to have it made appear, that he did not bring it to England till about the year 1474, and that the first book known to have been printed in English, and by him, was the History of Troy.

The matter of which the printing-letters consist is a compound metal, made up of lead, tin, antimony, &c. mixed in a certain proportion according to the discretion and experience of the founder. Each letter or character has its proper matrice, as they call it, which is a piece of copper, whereon the impression of such character has been struck by means of a steel punchion, on one end of which it is graven in relievo. In order to cast the letter, the matrice is placed at the end of an iron mould, inclosed within two thin pieces of board, and consisting of several parts, which have different names according to their different uses. Every thing belonging to the mould being properly disposed, and the metal melted over the furnace, the workman takes the mould in his left hand, and dips a little iron ladle with

a wooden handle into the metal, which he pours into the jet or funnel of the mould, whereby it is conveyed to the matrice ; at the same time moving his left hand briskly forwards, that the metal may run the better. This done, he unbends the bow, which is a thick steel wire, serving by its spring to press and retain the matrice in its place, and having opened the mould, he takes out the letter by means of a little hook, shuts it again immediately, replaces the matrice, and casts a new letter : and thus he proceeds with a surprising expedition till he has cast the number required. The letters are now examined, and those that are defective thrown aside ; the jets or tails are broken off, and the superfluous metal, occasioned by the mould's not being exactly closed, is cleared away with a knife. After this the two broad sides of the letters are rubbed on a hard coarse-grained stone, the person rubbing them having his two fingers next the thumb covered with a kind of finger-stalls made of leather, to prevent their being hurt by the friction ; and in turning the letters he makes use of his thumb so nimbly, without discontinuing the motion, that a by-stander might be easily deceived, and think they had all the while been rubbed on one side only. The letters thus ground remain still to be justified, that is, reduced to an exact height and thickness ; for which purpose they are placed on a sort of wooden ruler with a little ledge at the bottom, and the narrow sides are scraped, which underwent no rubbing on the stone.





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To make them of an equal height, they are ranged upside down in an instrument consisting of two long pieces joined together by screws, which being fixed very fast between two cheeks of wood, a plane is run along the bottom of the letters thus inverted, wherein a small groove is formed, and being now completely dressed and adjusted, they are fit for the printer's use.

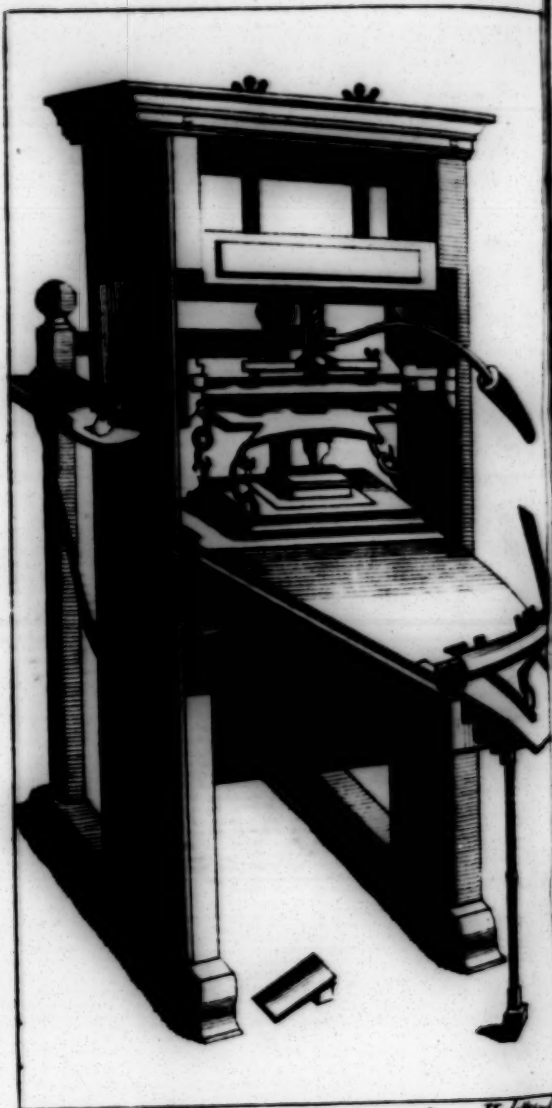
After this short view of the letter-founder's art, the reader may naturally expect some account of the method of printing. The letters then, being cast and finished as above described, are distributed, each kind by itself, into wooden cases, as they are called, which are divided into a proper number of little cells or boxes of different sizes. These cases are placed on a frame somewhat sloping, in the manner of a reading-desk, that the workman may reach the upper boxes the better, and be in less danger of mixing the letters by stretching his arm over them. The compositor, having a leaf of the work to be printed lying before him, stands against the middle of the case, holding in one hand an iron instrument called a composing-stick, and with the other he takes the letters, figures, points, &c. out of the boxes as he needs them, ranges them in the composing-stick on a slip of brass called a rule, and putting spaces between the words, he forms one line after another till the stick is full. He then empties the lines into a wooden instrument called a galley, fills his stick again, empties as
before.

before, and so on till he has finished a page; which he ties round with a small packthread, sets it by, composes another, and thus proceeds till the number of pages to be printed on one sheet be compleated. This done, he carries them to a smooth hard stone, placed horizontally like a table, on which he ranges them in due order and distance, puts round them a set of furniture consisting of pieces of wood of different dimensions, unties them, and at last fastens or locks them up in an iron frame called a chase, so that the whole may be lifted up from the stone, as if it were one solid piece of metal. In this state the pages, whether two, four, eight, twelve, or whatever number is to be printed on one side of the sheet, are called a form; and the corresponding pages, to be printed on the other side, are fixed in another chase in the same manner and at the same distance, so as to fall exactly on the back of each other. The two forms being thus imposed, as they term it, one sheet is printed, which is carefully read over, and the faults occasioned by the compositor's inattention, or the casual misplacing of the letters in the boxes, are marked in the margin. In order to correct these mistakes, the compositor lays the forms upon the stone, unlocks them, and with a sharp bodkin picks out the wrong letters, puts others in their room, and makes all other necessary alterations. After this the sheet generally undergoes a second reading and correction, and is then committed to the press.

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A printing press.

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The printing-press is a very complex machine, of which it is not easy to form an idea by a bare description. Its two principal parts, each whereof is composed of several others, are the body and the carriage. The body consists of two strong cheeks placed perpendicularly, joined together at top by a cross piece of wood called the cap. A little below is another piece called the head, which is moveable, being sustained by two iron pins or long bolts that pass through the cap; and in the head is fixed a brass nut, having a female screw or worm, which receives the male screw of the spindle. Through an eye or hole made in the spindle is rivetted an iron bar, by which the press is wrought; and the lower part, which is tapering and pointed with steel, is inclosed in a square wooden frame called the hose, having two cross planks called shelves to keep it steady. The point of the spindle works in a plug fixed in a brass pan supplied with oil; and this pan is fixed to an iron plate let into the top of the platten, which is a square smooth piece of wood, hanging horizontally, whereby the impression is made. Underneath all lies another piece called the winter, which bears the carriage, and sustains the effort of the press below, as the head does above, each giving way a little, the one upwards, the other downwards, to make the pull the easier.

On the carriage are nailed two long iron bars or ribs, faced with steel; and to the plank, sustained by the carriage, are nailed

short pieces called cramp-irons, equally tempered with the ribs, on which they slide when the press is turned in or out. Upon the plank is a square frame or coffin, containing a hard polished stone for the form to lie on; and underneath the carriage is fixed a small piece of iron called the spit, with a double wheel in the middle, round which run leather girts, that are nailed to each end of the plank; and by the means of a handle or rounce at the hither end of the spit, the pressman turns the plank in and out at pleasure. Opposite to the body of the press are the tympan, being two skins of parchment pasted on wooden frames, one so small as to lie within the other. The largest or outward tympan is fastened to the coffin by iron joints, and between both are placed blankets, which soften the impression of the platten on the surface of the letters, and render it more equable. To the top of this outward tympan is fixed by joints a thin frame of iron called a frisket, which is also covered with paper or parchment, so far as is necessary to keep the margin of the sheet clean, and no farther.

In working at press two men are generally employed, one of whom applies the ink upon the form by beating it over with two balls stuffed with wool, and nailed to a kind of wooden tunnels called ball-stocks; and the other lays the sheet on the outer tympan, turns down the frisket and tympan on the form, which he runs in under the platten by means of the

the spit-handle above-mentioned, gives two pulls with the bar to make the impression, and then turning the same handle the contrary way he brings back the form, lifts up the tympan and frieket, and takes off the printed sheet. The form is then beat over again with the ink-balls, another sheet laid upon the tympan, and printed in the same manner as before; and so the workmen proceed till they have wrought off the number of sheets required. This form being then taken off the press, the corresponding one is laid on, and the sheets printed on the other side, which renders them compleat. To get the ink off the forms, they are washed with a strong lye; and then the compositor, as he finds occasion, distributes the pages, i. e. replaces the letters in their proper boxes, to be used again in the succeeding sheets. All this is performed, both on the part of the compositor and the pressman, with a degree of expedition and address not easy to be imagined.

The invention of the rolling-press, for taking off prints from copper-plates engraven or etched, is commonly ascribed to Lipsius; but it appears to be earlier than his time, as Mr. Ellis observes, from a printed missal in the Bodleian library, dated 1481, where there is a print of the arms of the See of Wurtzburg in Germany, and those of the bishop, evidently taken off by the rolling-press, as the impression of the plate and other circumstances leave no room to doubt. The discovery of the art

of engraving is indeed said to be as ancient as the year 1460, and ascribed to Finiguerra, a goldsmith of Florence; however, nothing considerable was done in that way till some years afterwards by Martin of Antwerp, and then by Albert Durer and Lucas, who succeeded in it to admiration. About the same time the method of etching was discovered, that is, of eating the strokes or lines in the copper with aqua fortis, instead of cutting them with a tool or graver.

As to the structure of the rolling-press, it is much more simple than that of the printing-press above described; and we need only inform the reader, that the impression is made by passing the plate, covered with the paper and blankets, between two wooden cylinders or rollers, whence the machine has its name.

As the origin of printing is generally referred to the Germans, an art calculated for the promotion of knowledge and the general good of mankind, so are they likewise supposed to be the authors of those destructive and murdering inventions of guns and gunpowder. The discovery indeed, like many others, seems to have been casual, and, according to Polydore Virgil, the name of the inventor is not known. Thevet says the person was a monk of Friburg, whose name was Anelzen; but other authors, with more probability, ascribe it to Barholdus Schwartz, a friar, who in making chemical experiments,
mixed

mixed some salt-petre and brimstone with other ingredients, and set them upon the fire in a crucible, into which a spark happening to get, the pot suddenly burst with great noise and violence *. This unexpected effect surprised him at first; but repeating the experiment, and finding it constant, he set himself to work to improve it: to which purpose he caused an iron tube to be made, with a small hole at one end; and putting in some of his new composition, together with some little stones, he set fire to it, and found it answer his expectations, by penetrating all before it. This Schwartz, say they, taught the use of gun-powder to the Venetians, who first employed it in their war with the Genoese in 1380: but the invention is undoubtedly of an earlier date; for we read, that when Alphonfus, King of Castile, besieged the Moors in 1343, they discharged a sort of iron mortars which made a noise like thunder: and this is confirmed by what Don Pedro, Bishop of Leon, relates in his chronicle of King Alphonfus, who reduced Toledo, namely, that in a sea-fight between the King of Tunis, and the Moorish King of Seville, about that time, the Tunisiens made use of iron tuns or barrels, from whence they threw thunderbolts

* Polydore Virgil relates the story somewhat differently, viz. that the ingredients were put into a mortar covered with a stone, and the man striking fire near it with flint and steel, a spark accidentally flew in, whereby the composition was inflamed, and the stone blown up from the mortar.

of fire. Add to this what Du Cange tells us, that the registers of the chamber of accounts in France make mention of gunpowder as early as the year 1338. But after all, there is sufficient reason to think that our celebrated friar Bacon understood the composition of gunpowder long before Schwartz was born, or any mention is made of its being used in war, as has been already observed in another part of this work *.

Gunpowder is a composition of salt-petre, sulphur, and charcoal, mixed together and formed into little grains, which easily take fire, and are rarefied or expanded with surprising vehemence †. Writers vary with respect to the

* See Vol. I. p. 155.

† The effect of gunpowder is not very difficult to be accounted for, if we consider that the charcoal it contains takes fire like tinder, whereby the sulphur and salt-petre break into flame, and the latter expands itself to a prodigious degree, even so as to take up, according to computation, above ten thousand times the space it possessed before.

Sir Isaac Newton thus explains the matter: The charcoal and sulphur easily take fire, and kindle the nitre; and the spirit of the nitre being thereby rarefied into vapour, rushes out with an explosion, much like the vapour of water out of an æolipile. The sulphur also, being volatile, is converted into vapour, the acidity whereof causes the greater fermentation, by which the heat is augmented, and the explosion rendered more quick and vehement. The explosion of gunpowder, therefore,
arises

the proportions of the three ingredients, but as to the process there is little difference. All the ingredients are first finely powdered, then moistened with fair water, spirit of wine, vinegar, urine, or the like, and pounded together in a mortar for twenty-four hours at least; care being taken to wet the mass from time to time, to prevent its taking fire. It is then formed into balls as big as eggs, which are put into a sieve with a bottom of thick parchment made full of round holes; and by means of a wooden ball rolled about the sieve along with them, they are broken in pieces, and forced through the little holes in grains or globules, which being dried, the powder is compleat. To make large quantities, mills have been invented, whereby more work is done in one day, than a man can do in a hundred.

The invention of this destructive powder was naturally followed by that of guns, can-

arises from the violent action, when by the whole mixture being suddenly and greatly heated is rarefied into fume and vapour; which vapour, becoming so hot as to shine, appears in the form of flame.

M. de la Hire ascribes all the force and effect of gunpowder to the spring and elasticity of the air inclosed in the several grains, and in the intervals or spaces between them. According to him, the powder being kindled, gives motion to the springs of the numerous little particles of air; which is all the fire serves to do, the whole effect afterwards being produced by the air alone.

nons,

nons, mortars, and other instruments used in the modern art of war. The first cannons were called *bombardæ*, from *bombus*, by reason of their noise; and our word *bomb* had undoubtedly the same derivation. These military engines seem to have had their origin before the middle of the fourteenth century; for besides the testimonies already mentioned, historians inform us, that at the battle of Cressy, in 1346, there were five or six pieces of cannon in the English army, with which, Mezeray says, the French were intimidated, being the first time they had seen such thundering machines. As to the invention of bombs*, neither

* A bomb is a hollow iron ball or shell, filled with gunpowder, and thrown out of a short piece of ordnance called a mortar. There is a vent or aperture left in the shell, into which a fusée or wooden tube is driven, and fastened with a strong cement. This fusée is filled with a combustible matter, made of two ounces of nitre, one of sulphur, and three of gunpowder dust, well rammed; and this being set on fire burns slowly till it reach the powder in the shell, which goes off at once, bursting it to pieces with incredible violence. Great care is to be taken, that the fusée be so proportioned as not to set fire to the powder before the shell arrive at the place where it is designed to fall, otherwise it bursts in the air without doing the intended execution.

Maltus, an English engineer, is said to have first taught the regular use of mortars, in the year 1634; but he knew nothing of the curve the shot describes in its passage, nor of the difference of
range

ther the time nor the author is exactly known ; for according to M. Blondel, the first bombs were those thrown by Count Mansfeld into the town of Wachtendonk in Guelderland in 1588, though others say they were used almost a century before, viz. at the siege of Naples by Charles the Third in 1495. They began to be used in France in 1634, and since that time they have been commonly employed in sieges.

There is a very useful invention which some ascribe to the Germans, viz. that of clocks, such as are now in use amongst us ; at least they may be allowed to have retrieved the art, and to have excelled all the world in the contrivance of variety of motions, not only to shew the course of the hours and minutes, but even of the sun, moon, and stars ; of which the clocks at Straßburgh, Prague, and many other places in Germany, are sufficient instances. The Emperor Charles the Fifth had a watch in the jewel of his ring ; and in the elector of Saxony's stable may be seen a clock in the pommel of his saddle,

The necessity there is of measuring time has given rise to many inventions for that purpose, whereof that of sun-dials is of great antiquity ;

range at different elevations ; and yet there are certain rules, founded in geometry, for these things ; most of which we owe to Galileo and his disciple Torricelli.

witness

witness the dial of Ahaz, who began his reign 400 years before Alexander: but the art of dialling was not brought to its utmost perfection till the late discoveries in optics and astronomy. The use of the clepsydra is also very ancient*, which was a contrivance to measure time by the fall of a certain quantity of water; as we still do by the running of sand out of one part of an hour-glass into the other. The invention of clocks with wheels, springs, &c. is of a more modern date, being referred to Pacificus, archdeacon of Verona, who lived in the ninth century; though others ascribe it to Boethius, about the year 510†. Be this as it will, we are certain

* This sort of chronometer was invented in Egypt under the Ptolemy's; which the Egyptians made use of to measure the course of the sun, as Tycho Brahe did to measure the motions of the stars; and Dudley used the same contrivance in making his observations at sea.

As sun-dials were of service chiefly in the summer, so were the clepsydræ in the winter: but they had two defects; the one, that the water ran out with more or less facility, as the air was more or less dense; and the other, that it ran faster when the vessel was full, than when it was almost empty. M. Amontons, however, has invented a clepsydra free from both these inconveniencies.

† Dr. Derham makes clock-work of a much older standing, reckoning Archimedes's sphere, and that of Posidonius, among the machines of this kind; not that their form or use were the same with our clocks, but as having their motion from
some

tain that the invention of the pendulum-clock, whereby the measure of time is reduced to the greatest exactness possible, is owing to the happy industry of the last age, the honour of it being disputed between Huygens and Galileo.

The former, who published a treatise on the subject, declares that he first put it in practice in the year 1657; but Becher flickles for Galileo, by whose direction he says the first pendulum-clock was made at Florence, and a pattern thereof brought into Holland. This however is certain, that the invention never flourished till it came into the hands of Huygens, who insists upon it, that if Galileo ever thought of such a thing, he never brought it to any degree of perfection.

The first clock of this kind, made in England, was about the year 1662, by M. Fromantil, a Dutchman.

some hidden weights or springs, with wheels, pulleys, or some such clock-work principle.

Among the curious inventions of the ancients in this way, the Doctor also takes notice of Archytas's dove, which, according to Aulus Gellius, was made of wood, and so contrived as to fly about. To this he adds Regiomontanus's wooden eagle, which flew out of the city, met the Emperor coming towards it, and having saluted him, turned back again, waiting on him to the city gates: also his iron fly, which at a feast flew from his hand, and having taken a round, returned thither again.

The

The invention of spring or pocket watches was likewise about the middle of the last century, and the honour of it lies between Dr. Hooke and M. Huygens, the English ascribing it to the former, and foreigners to the latter. Dr. Derham is a strenuous advocate for Dr. Hooke, and tells us that he contrived various ways of regulating watches, of which one was a loadstone. Another was by a slender strait spring, one end whereof played backwards and forwards with the balance, so that the balance was to the spring as the bob to a pendulum, and the spring as the rod thereof. A third method was by two balances, some of which were made with a spiral spring for a regulator, and others without. One of these watches with a double balance was made by Mr. Tompion in 1675, and presented to King Charles the Second; and the invention quickly getting into repute, both at home and abroad, two of them were sent for by the Dauphin of France. Soon after this M. Huygens's watch with a spiral spring appeared in England, and great matters were expected from it, as if it would serve to discover the longitude. This watch agreed with Dr. Hooke's in the application of the spring to the balance, but the pulses of M. Huygen's were much slower, and the balance, instead of turning once round, as Dr. Hooke's, turned several times every vibration. Huygens invented several other kinds of watches, some without any string or chain, to which in particular he gave the name of pendulum watches.

Repeating clocks and watches, *i. e.* such as by pulling a string, or other means, repeat the hour and quarters at any time of the day or night, are undeniably the invention of Mr. Barlow, who first put the contrivance in practice in larger movements, or clocks, about the year 1676 ; in which he was soon followed by other artists : but the application of it to pocket-watches was not known till the reign of King James the Second, when Mr. Barlow solicited a patent to secure his invention. The talk of this engaged Mr. Quare to put in execution a like contrivance, which he had thoughts of some years before ; and as he endeavoured to prevent Mr. Barlow's obtaining a patent, a watch of each kind was shewn before the king and council, and upon trial the preference was given to Mr. Quare's.





S E C T. V.

Particular Descriptions of the most remarkable Public Buildings, and other singular Productions of Art, in Germany, Bohemia, Hungary, and Switzerland.

C H U R C H E S.

THE cathedral church of Vienna, dedicated to St. Stephen, is a most stately fabric and generally admired, though some object against the darkness of the inside, occasioned by the painted glass of the windows. The steeple is certainly one of the strongest and loftiest in Germany, being four hundred and sixty-five feet high; and under the cross on the top there were formerly the Turkish arms, viz. a half-moon and star, set up by the citizens when Solyman the Magnificent besieged the city, because he agreed to spare the steeple on that condition. This church contains many sumptuous monuments of princes and other great persons, the altars are richly adorned, and upon the whole the beauty of the inside is answerable to its majestic appearance without.



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The cathedral of Saltzbourg is a magnificent edifice of free stone, having a very stately front, and is reckoned one of the completest in Germany. It is built in form of a cross, with a lofty dome which separates the nave from the choir. The inside of the church is adorned with pilasters of the Corinthian order, and the pavement consists of great squares of marble of various colours. The high altar is of beautiful marble, whereon is placed, on grand festivals, a sun of gold, set with precious stones of immense value; also a large cross of solid gold, and four golden candlesticks. Here is an organ remarkable for its largeness, besides four others of a lesser size; and amongst the principal ornaments of this church we may reckon four marble statues bigger than the life, of St. Peter, St. Paul, St. Rupert, and St. Virgilius: St. Rupert is said to have been the first bishop of Saltzbourg.

Those who have a taste for Gothic structures will scarce find any in Germany more beautiful than the cathedral church of Bamberg in Franconia, which is a vast edifice, having a lofty steeple, and four noble spires of bold workmanship, supported by tall pillars that appear very light and easy: But perhaps a short account of the treasure it contains may be more agreeable than a description of the building.

The Emperor Henry the Second was the founder of this bishopric, and his tomb with

that of his consort are to be seen in this cathedral, besides very fair ones of several of its bishops. In the treasury of the church is still preserved the Imperial crown of the said emperor, consisting of six plates of gold adorned with precious stones; and another of his empress, composed of two circles of gold, set also with pearls and jewels. Here is a statue of the virgin five feet high, all of solid silver; and another of St. George, on horseback combating the dragon, which is of silver gilt, and seven feet high. Amongst many other rich curiosities here are likewise two fine vases of porphyry, a portable altar of massy gold, a little tabernacle and a large chalice of the same metal, a shrine of gold for relics, and a fine crucifix of rock-crystal, the Christ being of solid gold, and the whole adorned with rubies and emeralds. To these we may add a heavy cross of gold eighteen inches long, and another yet larger of silver gilt, both given by the above-mentioned emperor. Nor ought we to forget one of the greatest rarities of this treasury, which is a folio manuscript of the four gospels in Latin, written upon fine vellum in a neat Roman character, with some Gothic letters interspersed, and the most beautiful miniatures imaginable. The covers are of wood, curiously inlaid with figures in ivory, representing our Saviour's passion, and on a gold border are the heads of the apostles, as are those of the evangelists at the four corners.

Here

Here is also a vast number of candlesticks, lamps, censers of gold and silver, and other utensils belonging to this treasury.

The cathedral of Ulm in Swabia, now belonging to the Lutherans, is a lofty and well-proportioned structure as any in the circle, and confessedly one of the finest in the empire. It is said to have been above a hundred years in building, and that the very shell of it cost 135,000 l. sterling, exclusive of the windows, whereof there are six in the choir that are most beautifully painted. This church has a large square tower, and five stately spires, one of which is supported by six and thirty pillars. The tabernacle, which formerly contained the consecrated host, is a curious piece of work, and said to have cost a hundred thousand florins, being a singular kind of marble, and adorned with abundance of statues. The choir is full of beautiful sculptures, representing pieces of scripture-history; and here is a noble organ, which was more than twenty, some say more than thirty years in compleating. It is thirty-nine feet high, and twenty-eight broad, has sixteen pair of bellows, and above three thousand pipes of English tin, of which the largest is thirteen inches in diameter *.

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* As fine an organ as this is, Dr. Nicholson thought it inferior to that in the cathedral of Exeter, which is said to have pipes of fifteen inches

The great church at Bern in Switzerland, is a very magnificent structure, and reckoned a master-piece in the Gothic architecture. It has a fine lofty steeple, and is remarkable for having the largest bell in Switzerland, weighing upwards of ten tons. The great door is adorned with a representation of the parable of the wise and foolish virgins, and the sculptures in general, both within and without, are very well executed. There are also some admirable paintings in this church.

Belonging to a church at Erfurt is a bell, which is reckoned the largest in Europe, weighing upwards of twelve tons, being eleven feet high, and thirty-three feet in circumference; and it is said the sound of this bell may be heard at the distance of twenty-four miles*.

About

in diameter; and as to the number of pipes, we are told there is an organ at Lubeck in Saxony, consisting of six thousand.

* It may perhaps seem strange to some people, that the sound of bells which hang in plains may be heard farther than those which are placed upon hills; the reason whereof will be understood by considering, that as the air is the medium of sound, the higher the sonorous body is placed, the more rarified is that medium, and consequently the less proper vehicle to convey the sound to a distance. We may also observe, that the sound of a bell struck under water is a fourth deeper than in the air, as Mr. Hawksbee and others have found

About three miles from Fribourg in Switzerland, is an hermitage dedicated to Mary Magdalene, and situated among woods and rocks in the prettiest solitude imaginable. It is described by several travellers, particularly M. Blainville and Mr. Addison, who both saw it, about the beginning of the present century, when the hermit was still alive. He had wrought out of a rock a pretty chapel, with
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found by experiment ; though Mersenne says it is of the same tone in both elements

As to the distance to which sounds may be sent, divers experiments have been made, to try whether there was any difference in that respect between the northern and southern parts of the world. Guns were tried for this purpose at Florence, and persons appointed to observe them near Leghorn heard the report plainly enough, though the distance is little less than fifty-five miles in a straight line. The Leghorn guns are often heard at Porto Ferrajo, which is above sixty miles off ; and when the French bombarded Genoa, they heard it at Monte Nero near Leghorn, upwards of ninety miles distant : Nay, people of good credit have affirmed, that at the siege of Messina, the report of the guns was heard at Augusta and Syracuse, about one hundred Italian miles. These distances being so considerable, induced Dr. Derham to suspect, that sounds fly as far, or nearly as far, in southern as in northern climates, notwithstanding we have some instances of their being propagated to greater distances in the northern parts of the world,
than

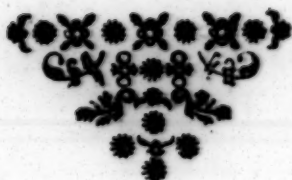
an altar, sacristy, and steeple; also five chambers, a parlour, refectory, kitchen, cellar, and other conveniencies. The funnel of his chimney, which pierces from his kitchen to the top of the rock, slanting all the way, is ninety feet high, and cost him so much toil, that he was a whole year about it, and often despaired of finishing his design. All this must appear the more surprizing, when we consider the dimensions

than any above-mentioned: for Dr. Hearn, informed the Royal Society, that the guns fired at Stockholm in 1685, were heard almost one hundred and eighty English miles; and in the naval engagement between the English and Dutch in 1672, the report of their guns was heard above two hundred miles off, even as far as Shrewsbury and Wales.

With respect to the velocity of sound, the most celebrated philosophers differ about it; but Dr. Derham, by the nicest experiments, found that it flies at the rate of an English mile in nine half seconds and a quarter, or one thousand one hundred and forty-two feet in one second of time; and in this he agrees with Mr. Flamsteed and Dr. Halley. The same gentleman observed, that there is some difference, though a very small one, in the swiftness of sounds with or against the wind, or according as the wind is stronger or weaker, but that nothing else accelerates or retards their motion; that they fly equal spaces in equal times; and that all kinds of sounds, whether of bells, guns, or other sonorous bodies, or whether loud or languid, move with the same degree of velocity.

mensions of the different parts of this hermitage, the chapel being sixty-three feet in length, thirty-six in breadth, and twenty-two in height. The sacristy, or vestry, is twenty-two feet square, and the height of the steeple seventy feet. The chamber between the chapel and the refectory is above forty feet long, the refectory itself is twenty-one, and the cellar is twenty-five feet long, and ten feet deep. But the hall or parlour is particularly admired, being twenty-eight paces in length, twelve in breadth, and twenty feet in height, with four openings for windows, much higher and wider than those of our best houses. At one end of this hall was the hermit's cabinet, with a small collection of books and other curiosities. To add to the pleasantness and convenience of this habitation, he had cut the side of the rock into a flat, and having covered it with good mould, had formed a pretty garden, planted with divers sorts of fruit-trees, herbs, and flowers; and by following the veins of water that dropped from several parts of the rock, he had made himself two or three fountains, which supplied his table, and watered his little garden. This hermit, whose name was Jean du Pré, began this laborious undertaking at the age of thirty, and said he was twenty-five years in compleating it, having had no sort of assistance from any person whatsoever except one servant. He intended to have carried on his work still farther, but was drowned in 1708, as he was crossing a neighbouring river in a boat with some company that came to visit him

Alm on St. Antony's day, the patron of his chapel. His place is supplied by a priest, who subsists by the generosity of strangers that come to see the hermitage, whom he generally entertains with bread and wine and a nosegay.



REMARKABLE PALACES, *and other* BUILDINGS.

ONE of the most magnificent palaces of Germany is the Elector of Bavaria's palace at Munich. This is indeed a superb structure, fit for the reception of the greatest monarch in Europe. According to the Marquis of Palavicino, who has given a description of it, the Electoral palace at Munich contains eleven courts, six chapels, twenty halls, 2,600 large windows, nineteen galleries, sixteen great kitchens, twelve large cellars, and forty apartments, all on one floor, in which are three hundred rooms, richly furnished, and filled with paintings, statues, relievos, and other ornaments. One objection indeed is made to this fine building, viz. that its chief front, which looks towards a narrow street, has the resemblance of a convent, to which the image of the Virgin Mary over the great gate contributes not a little; and it is also observed, that having been built at several times, the architecture is somewhat irregular. The beauty of the inside, however, is confessed on all hands; but that called the Emperor's apartment is particularly admired. The great hall of this apartment is a hundred and eighteen feet long, and fifty-two broad, and is adorned with curious pictures of sacred history on one side, and profane on the other. The chimney-piece is also embellished with fine figures amongst

amongst which is a statue of porphyry representing virtue with a spear in her right-hand, and a palm-branch in her left. It is said that Gustavus Adolphus, King of Sweden, was so delighted with this hall, that he was sorry he could not get it transported to Stockholm.

But the late elector added a new apartment to this palace, which, though not so large as the emperor's, surpassed it in elegance and splendor. It was adorned with excellent paintings, and abundance of antique busts and vases, placed upon tables of great value; but in the year 1730 this new apartment was burnt down by a fire which broke out in the night-time, so that scarce any of the fine furniture was saved, and the elector and his consort narrowly escaped the flames. In the little chapel belonging to the apartment of the electress hardly any thing was to be seen but gold, pearls, and jewels. The furniture of the palace in general was rich beyond imagination; and in the treasury were whole services of gold plate and other costly vessels, with an incredible number of diamonds, rubies, and other precious stones. Add to these the many fine paintings, statues, busts, &c. with which the galleries, halls, stair-cases and chambers were adorned; besides a very valuable library, and a vast collection of coins, medals, and other rarities both antient and modern.

The

The electoral palace of Nymphenbourg, where the court frequently resides, is charmingly situated in the middle of a large plain, and affords from the windows of the second story a prospect of innumerable rural beauties. The grand avenue leading to this palace consists of a double row of elms on each side of a noble canal, which at each end has a spacious bason adorned with water-works. By a flight of marble steps we ascend into a very large and lofty salon, from whence on each hand there is a passage into several apartments richly furnished : and having crossed this spacious hall, we descend by marble-steps into the gardens. Here the first thing that strikes the eye is a parterre of a vast extent, at the entrance of which there is a great bason, with a group of gilt figures in it, representing Flora receiving flowers from nymphs, and cupids. This parterre is terminated by a most delightful wood, through which are cut three walks, whereof the middlemost fronts the grand pavilion of the palace, and has a large canal running the whole length of it, and ending with a fine cascade. The walk on the right hand leads to a semi-circular mall, at the entrance of which is a pretty pavilion called Pagodebourg, being built in the form of a Pagod * or Indian temple ; and the furni-

* This name the Portuguese have given to the temples of the Indians, Chinese, and other eastern idolaters. It is also used to signify the idol adored in the temple ; and is likewise the name of a gold coin current in several parts of the Indies.

ture of this little palace is entirely Indian, all surprizingly neat and elegant. In the walk on the left hand is a larger building called Badenbourg, or the bathing-house, the baths whereof are spacious, lined with marble, and adorned with statues and vases; and there is also an apartment richly furnished, and embellished with gildings, paintings, and other ornaments. This fabric is surrounded with fine pieces of water, cascades, and statues; and, in a word, both art and nature seem to have strove to render these gardens magnificent and delightful.

At Darmstadt, in the landgraviate of Hesse, is a palace belonging to the Landgrave, which, had it been finished according to the original model, would have been one of the largest and most magnificent in Europe; the part which is finished has a very grand appearance, and the apartments are stately and richly furnished.

The Elector of Palatine's palace, at Mannheim, is a large, stately, and substantial building, consisting of two great courts separated by an open gallery, or terrace, on which is lavished a profusion of ornaments. This palace fronts a large and beautiful square, consisting of lodgings for the officers of the court: the apartments of the palace are very magnificent, and have perhaps the finest prospect in the world.

At Prague is a magnificent royal palace, belonging to the Queen of Hungary, with a summer-house affording a delightful prospect.

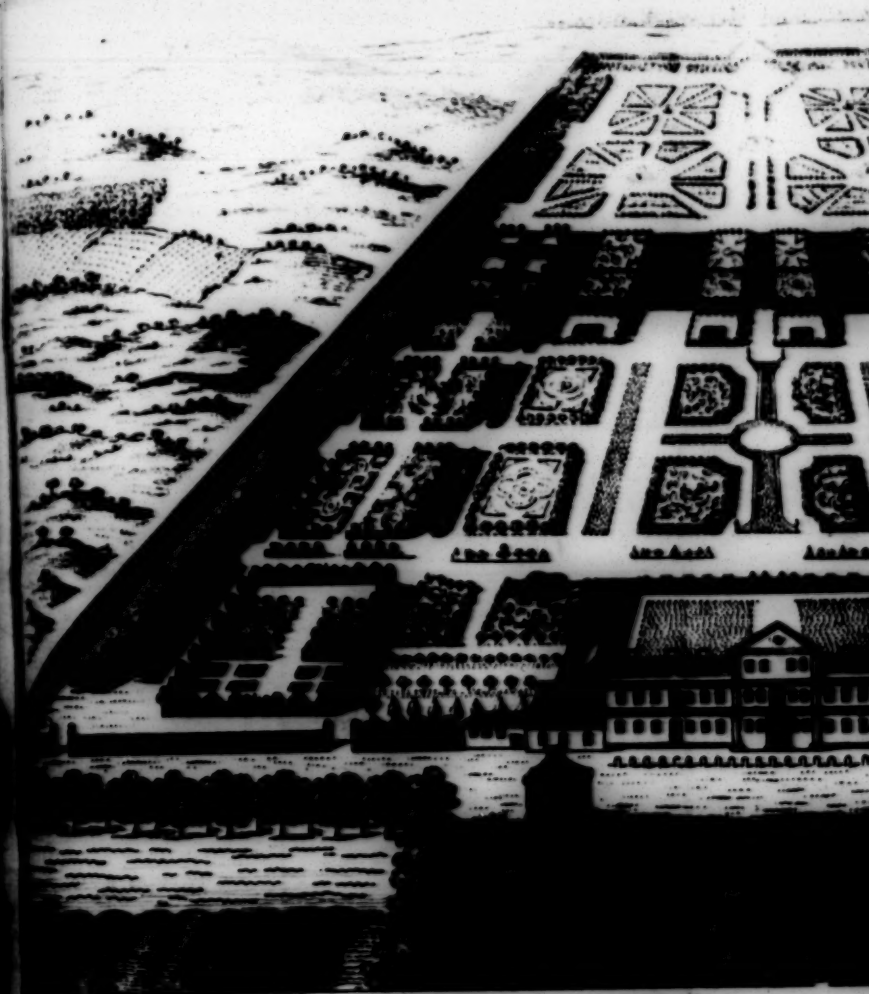
The bishop of Bamberg has two palaces in that city, the old, and the new; of which the latter is a vast pile of free-stone, three stories high, with a very regular front between two noble wings, containing grand and commodious apartments, well furnished, and adorned with excellent paintings. The building is modern, having been erected by a late bishop, who also built Pommersfelden, a country palace or hunting-seat about eight miles from Bamberg, reckoned one of the most beautiful and compleat structures in the empire. It is likewise of free stone, built in the form of a square, with four large towers, one at each corner; and all round the court within there is a noble piazza. Here is a magnificent staircase, and one of the best contrived in Europe, which is beautifully painted, as well as the ceilings of the principal apartments. The salon, which serves as a passage to the garden, is also finely painted, and adorned with marble statues; and all the furniture and ornaments of the palace, as well as the apartments themselves, are disposed with the utmost elegance and judgment.

His Prussian Majesty's palace at Berlin, the capital of the electorate of Brandenburg, is a stately fabric of free-stone, consisting of four

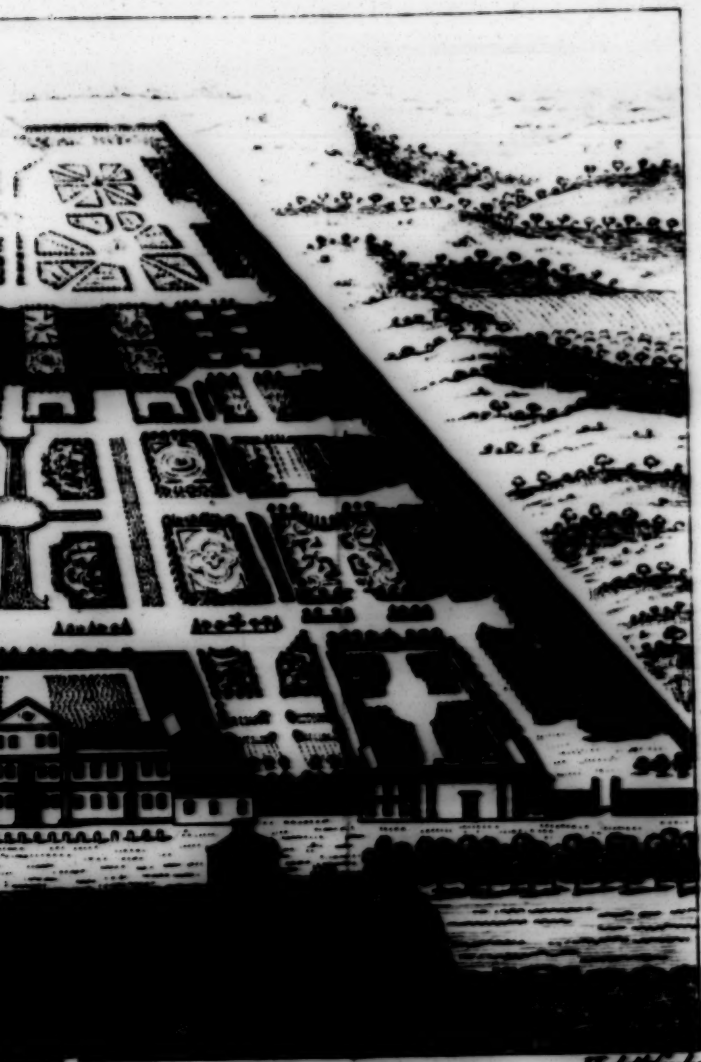
stories. It was begun by Frederick the First, in 1699, and having been the work of several architects, the fronts are not exactly regular. The apartments are large, the cieling's lofty and beautifully painted, and the furniture truly royal, there being particularly such a quantity of silver, as is scarce to be paralleled in any other palace in Europe. Most of the tables, stands, looking-glass frames, chandeliers, screens, &c. are of that metal; and there is a buffet, which takes up one entire side of a room, filled with cisterns, large basons, and other vessels of silver gilt. There is a fine gallery in this palace, adorned with admirable paintings, done by the best masters; and on the cieling are represented the principal actions of the late elector. On the side next the garden is a noble library, and near to it is a cabinet of curiosities, with a choice collection of medals.

His Britannic Majesty's palace at Herenhausen near Hanover, is chiefly famous for its beautiful gardens, which in some respects are thought equal to any in France, and superior to most in the empire. The walks are laid out in the most elegant manner, the wilderness of ever-greens is charming, and here is one of the largest and noblest orangeries in Europe; also a perfect theatre cut in green seats, with arbours and summer-houses for the actors to dress in or retire to as occasion requires. They are adorned throughout with statues, vases, and whatever else is necessary to render them noble and delightful.





View of y^e Palace & Gardens, belonging to his Britannick M^y



Herrenhausen
The Palace of Herrenhausen, near Hanover.



lightful ; but above all, they are admired for their beautiful fountains, cascades, and other water-works.

The magnificent town-house at Augsbourg, is a structure which merits observation as much as any thing of the kind in Germany. It is a large square building, all of free-stone, except the portico, which is of reddish marble, crowned with a balcony of the same, supported by stately columns of white marble. At the top of the front, just below the pediment, there is a large spread-eagle in brass, which holds in its talons a globe and sceptre, the whole said to be two and twenty hundred weight, and to have cost above 1800 l. sterling ; and over the gate are the city-arms, supported by two brazen griffins, all of excellent workmanship. The great hall, which is one hundred and ten feet long and fifty-eight broad, is paved with marble, and enlightened by fifty-two windows, and adorned with fine paintings and statues in niches. The cieling is divided into a vast number of compartments, the squares and pannels whereof are embellished with fine gilded sculptures and other ornaments. From this hall we ascend into another of equal beauty and magnificence, the workmanship of the cieling being admirable, and every part of it adorned with a profusion of fine sculpture, gilding, and painting. In the four adjoining chambers, each forty feet square and nineteen in height, which are covered with excellent pictures, the magi-

strates give audience to the envoys of the emperor, the electors, and other sovereign princes. There are likewise several chambers for the council, the court of justice, &c. all of them filled with fine paintings, and over the doors are the busts of pagan and christian Emperors.

In this city is an inn called the Three Kings, which is the most superb inn in Europe, and one of the finest buildings in Germany; and in the town of Halberstadt, in the principality of the same name, is a remarkable inn called the Commis, or factory, reckoned the largest in Europe.

The town-house of Zurich in Switzerland, rebuilt in 1694, is a fine regular structure of free-stone, three stories high, with a frontispiece fifty paces in breadth, supported by pillars of black marble streaked with white, and resting upon bases and chapiters of brass. On the top of each of the two pillars, close to the entrance, is the figure of a lion of gilt brass, holding an escutcheon, with the arms of the city; and this building is finely adorned with sculptures both in wood and stone, together with exquisite paintings.

At Ratibon in Bavaria, is a fine stone bridge over the Danube, consisting of fifteen lofty arches of free stone, each twenty-three feet wide, supported by square pillars, and defended by buttresses. This bridge is 1091 feet in length,

length, and twenty-three feet in breadth, with three beautiful towers, through each of which is a handsome gateway.

At Bex, in the canton of Bern in Switzerland, is a stone bridge over the Rhone, dedicated to St. Maurice. It is near five hundred feet long, and consists only of one arch, of a considerable height, with a handsome tower on the top. And in the canton of Uri, there is a stone bridge over the Rufs, of a surprising height, consisting only of one arch, resting upon two very high rocks. It is called Devil's bridge, from a notion of the inhabitants in the neighbourhood, that it must have been erected by the devil.

Several towns in Germany are remarkable for tuns or wine vats of an uncommon size ; but the tun of Heidelberg, which stands in a vast cellar under the Elector Palatine's palace, is of all others the most celebrated. The first we hear of was large enough to contain five hundred and twenty-eight hogsheads of wine ; but that tun was rebuilt in 1664, and made to hold six hundred hogsheads English measure. The old one had iron hoops, each weighing above 1200 pounds : but the next tun was girt about with very strong hoops of knee timber, adorned with paintings and inscriptions, and supported by carved pedestals. There was also a stair-case of forty-three steps, which led to the top of it, where
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the electors themselves have had frequent carousals. It is said, that this prodigious vessel was emptied and broke to pieces by the French in 1688; but that another was afterwards built of a yet greater capacity, which is perhaps still in being.

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